

Bryson, Santana and Joshua v. Rough Country, LLC

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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF GEORGIA
GAINSVILLE DIVISION

SANTANA BRYSON AND JOSHUA
BRYSON, as Administrators
of the Estate of C.Z.B.,
and as surviving parents of
C.Z.B., a deceased minor,

Plaintiffs,

vs.

ROUGH COUNTRY, LLC,
Defendant.

CASE NO.

2:22-CV-017-RWS

VIDEOTAPE DEPOSITION OF G. BRYANT BUCHNER, P.E.
APPEARING REMOTE FROM
TALLAHASSEE, FLORIDA

JANUARY 23, 2024

11:13 A.M.

Reported Remotely By:
Judith L. Leitz Moran
RPR, RSA, CCR-B-2312

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<p>1 REMOTE APPEARANCES OF COUNSEL</p> <p>2</p> <p>3 On behalf of the Plaintiffs:</p> <p>4 TEDRA L. CANNELLA, ESQUIRE</p> <p>5 DEVIN L. MASHMAN, ESQUIRE</p> <p>6 CANNELLA SNYDER LLC</p> <p>7 315 W Ponce de Leon Avenue</p> <p>8 Suite 885</p> <p>9 Decatur, Georgia 30030</p> <p>10</p> <p>11 On behalf of Defendant:</p> <p>12 RICHARD H. HILL, ESQUIRE</p> <p>13 WEINBERG, WHEELER, HUDGINS,</p> <p>14 GUNN & DIAL, LLC</p> <p>15 3344 Peachtree Road, N.E.</p> <p>16 Suite 2400</p> <p>17 Atlanta, Georgia 30326</p> <p>18</p> <p>19 ALSO PRESENT:</p> <p>20 JONATHAN MILLER, VIRTUAL VIDEO TECHNICIAN</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p>	<p>1 WITNESS APPEARED REMOTELY FROM TALLAHASSEE, FL</p> <p>2 JANUARY 23, 2024 - 11:13 A.M.</p> <p>3</p> <p>4 VIDEO TECHNICIAN: We are on the record</p> <p>5 January 23rd, 2024, at approximately 11:13 a.m.</p> <p>6 Eastern Time.</p> <p>7 This will be the videotape deposition of</p> <p>8 George Bryant Buchner.</p> <p>9 Would counsel please identify themselves</p> <p>10 and who they represent for the record.</p> <p>11 MR. HILL: Rick Hill --</p> <p>12 MS. CANNELLA: Tedra Cannella and Devin</p> <p>13 Mashman for the Plaintiffs.</p> <p>14 MR. HILL: We spoke over each other</p> <p>15 there. Did you catch that, Court Reporter?</p> <p>16 MS. CANNELLA: Oh, sorry. Tedra Cannella</p> <p>17 and Devin Mashman for the Plaintiffs.</p> <p>18 MR. HILL: Rick Hill on behalf of the</p> <p>19 Defendant.</p> <p>20 VIDEO TECHNICIAN: Would the court</p> <p>21 reporter please swear in the witness.</p> <p>22 THE COURT REPORTER: Mr. Buchner, please</p> <p>23 raise your right hand.</p> <p>24</p> <p>25</p>
Page 3	Page 5
<p>1 I N D E X</p> <p>2 EXAMINATION PAGE</p> <p>3 BY MR. HILL 5</p> <p>4</p> <p>5 E X H I B I T S</p> <p>6 (EXHIBITS SUBMITTED ELECTRONICALLY)</p> <p>7 EXHIBIT NO. PAGE</p> <p>8 Exhibit 1 Defendant Rough Country, 10</p> <p>9 LLC's Second Amended Notice</p> <p>10 of Taking Videotaped</p> <p>11 Deposition Duces Tecum of</p> <p>12 G. Bryant Buchner, P.E.</p> <p>13 Exhibit 2 Curriculum Vitae 12</p> <p>14 Exhibit 3 Testimony List of G. Bryant 43</p> <p>15 Buchner, September 17, 2020</p> <p>16 to October 11, 2023</p> <p>17 Exhibit 4 Fee Schedule 50</p> <p>18 Exhibit 5 Invoices 50</p> <p>19 Exhibit 6 10/12/2023 Report 73</p> <p>20 (BRYSON 001350 - 001361)</p> <p>21 Exhibit 7 Support Documents 75</p> <p>22 (BRYSON 001362 - 1374)</p> <p>23 Exhibit 8 Calculated Stock Vehicle 117</p> <p>24 Crush</p> <p>25 (BRYSON 003990 - 003999)</p>	<p>1 G. BRYANT BUCHNER, P.E.,</p> <p>2 being first duly sworn, was examined as follows:</p> <p>3 MR. BUCHNER: Yes, I do.</p> <p>4 EXAMINATION</p> <p>5 BY MR. HILL:</p> <p>6 Q Thank you, Mr. Buchner. My name is Rick</p> <p>7 Hill. I think we've met a couple of times in the</p> <p>8 past. It's good to see you again.</p> <p>9 A Thank you.</p> <p>10 Q I wanted to start just by identifying,</p> <p>11 since I'm not there, what you may have brought with</p> <p>12 you to the deposition.</p> <p>13 I know you provided file material to</p> <p>14 counsel for the Plaintiffs which have been provided</p> <p>15 to us prior to the deposition.</p> <p>16 Did you bring everything that you had</p> <p>17 previously produced to the Plaintiff's counsel with</p> <p>18 you today to the deposition?</p> <p>19 A Yes.</p> <p>20 Q Okay. And do you have it in electronic</p> <p>21 format or do you have it in paper format?</p> <p>22 A Yes, I have some of it in paper format.</p> <p>23 All of it in electronic format to the best of my</p> <p>24 abilities. Every now and then things get crossed.</p> <p>25 But, yeah, most of it's -- I should have everything</p>

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<p style="text-align: right;">Page 6</p> <p>1 in electronic.</p> <p>2 Q Sure. One of the things that I don't</p> <p>3 believe we have is the actual digital electronic</p> <p>4 version of the HVE case file.</p> <p>5 Have you provided that to counsel for the</p> <p>6 Plaintiffs?</p> <p>7 A No, we have not. We have -- our practice</p> <p>8 is to record the printed copy because the</p> <p>9 electronic copy sometimes doesn't get properly</p> <p>10 saved or something will happen to it.</p> <p>11 In this case I'm not aware that I have</p> <p>12 been able to find the original electronic copy,</p> <p>13 but -- so I'm -- I couldn't get it over the</p> <p>14 weekend. I wasn't here over the weekend.</p> <p>15 So if we have to have it, we'll keep</p> <p>16 looking, but at this point in time I don't have --</p> <p>17 I don't have that exact document for you. We have</p> <p>18 the -- the archived document which is the data</p> <p>19 itself.</p> <p>20 Q Okay. When you say "the archived</p> <p>21 document," just so I understand you have on your</p> <p>22 system the original digital version of the case</p> <p>23 file or is that what you're not able to locate and</p> <p>24 you would just have an archive version of it</p> <p>25 digitally somewhere?</p>	<p style="text-align: right;">Page 8</p> <p>1 MS. CANNELLA: Mr. Hill, what was the end</p> <p>2 of that question? I couldn't hear it. The</p> <p>3 original HVE file that would contain?</p> <p>4 BY MR. HILL:</p> <p>5 Q All of the data and reports generated by</p> <p>6 the HVE software.</p> <p>7 A Well, we -- we printed and generated</p> <p>8 everything that we need or could possibly need.</p> <p>9 If someone else wants something, we can</p> <p>10 always re-enter it and rerun it, I don't have a</p> <p>11 problem doing that.</p> <p>12 I'm just telling you that what was open</p> <p>13 when we hit print, we didn't find that the way we</p> <p>14 thought we would and that's the electronic filing</p> <p>15 issue.</p> <p>16 But we can re-enter it and, you know,</p> <p>17 give you that, that wouldn't be a problem.</p> <p>18 BY MR. HILL:</p> <p>19 Q Sure. And when you say re-enter it, just</p> <p>20 so I understand, you would need -- actually, rerun</p> <p>21 the test?</p> <p>22 A Right. We would just --</p> <p>23 Q Rerun the same --</p> <p>24 A Rerun it again, yeah, to the best of our</p> <p>25 abilities.</p>
<p style="text-align: right;">Page 7</p> <p>1 A Well, you said case file just there. A</p> <p>2 minute ago, I thought you said the HVE file.</p> <p>3 Q Yeah, the HVE what I call case file which</p> <p>4 is the original HVE file.</p> <p>5 A Yeah, I don't -- when I looked, we didn't</p> <p>6 have that. We have -- we maintain the paper copies</p> <p>7 of everything obviously because they can be put</p> <p>8 under lock and key, but anybody on the computer</p> <p>9 doing other work can, you know, move things around</p> <p>10 on us from time to time.</p> <p>11 So I mean, I'm not saying I don't have</p> <p>12 it, I'm saying I couldn't find it when they looked</p> <p>13 for it this weekend.</p> <p>14 Q Now I understand.</p> <p>15 So you -- after it was originally</p> <p>16 generated, you printed out hard copies of the</p> <p>17 various reports that it generates and you kept</p> <p>18 those?</p> <p>19 A Right. Yes.</p> <p>20 Q But you're not able to locate that</p> <p>21 original HVE file that would contain all of those</p> <p>22 reports in a digital format?</p> <p>23 A Not -- not as of yet, no, sir.</p> <p>24 Q Okay.</p> <p>25 A So.</p>	<p style="text-align: right;">Page 9</p> <p>1 Q All right. And I just ask that because I</p> <p>2 believe we received the damage data report, the</p> <p>3 accident history report. Those were produced a</p> <p>4 week ago or more than a week ago with your original</p> <p>5 file.</p> <p>6 And then over the weekend, we received</p> <p>7 the event data report and the vehicle data report</p> <p>8 and the geometry files.</p> <p>9 But what we haven't seen is the driver</p> <p>10 controls report, the environment data or the</p> <p>11 messages report.</p> <p>12 And I guess what you're saying is you</p> <p>13 didn't print those other three reports out at the</p> <p>14 time it was originally run and you're not sure</p> <p>15 whether you still have it?</p> <p>16 A Right. And to me, they're -- they</p> <p>17 wouldn't be relevant because we're only simulating</p> <p>18 the crash component of it, we're not trying to run</p> <p>19 the vehicle to see if they go to rest or anything</p> <p>20 like that.</p> <p>21 It's a -- we're simply using it for the</p> <p>22 contact phase, but -- so we -- we never printed</p> <p>23 those. But if we -- somebody's got to have them,</p> <p>24 we'll just have to try to recreate the wheel which</p> <p>25 we can do or anybody else can recreate the wheel --</p>

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<p style="text-align: right;">Page 10</p> <p>1 Q Sure.</p> <p>2 A -- if they have the program and want to.</p> <p>3 Q Okay. But you have produced all the</p> <p>4 printouts that you have from that HVE simulation?</p> <p>5 A Yes.</p> <p>6 Q Okay. All right. Just so that we have</p> <p>7 it, I will share my screen here. And we -- I'll</p> <p>8 attempt to. I'm having some issues.</p> <p>9 Give me one second to figure this out.</p> <p>10 Hopefully this will work.</p> <p>11 A Agreed.</p> <p>12 Q I'm nervous. Got off to a rough start.</p> <p>13 Okay. Can you see my screen?</p> <p>14 A I can.</p> <p>15 Q Okay. Great.</p> <p>16 (Deposition Exhibit 1 marked.)</p> <p>17 BY MR. HILL:</p> <p>18 Q I'm just going to attach this as</p> <p>19 Exhibit 1. This is just the notice to the</p> <p>20 deposition just so we'll have it attached.</p> <p>21 And I'll fast forward here hopefully to</p> <p>22 the Exhibit A. And I know that there were some</p> <p>23 objections to some of the items requested here.</p> <p>24 As I understand it, the objection was</p> <p>25 based upon communications with counsel in</p>	<p style="text-align: right;">Page 12</p> <p>1 (Off the record.)</p> <p>2 VIDEO TECHNICIAN: The time is 11:24. We</p> <p>3 are back on the record.</p> <p>4 MR. HILL: Thank you. Sorry. I was just</p> <p>5 going to joke that I -- witnesses like to not be</p> <p>6 able to hear my questions because my questions</p> <p>7 don't make any sense.</p> <p>8 THE WITNESS: Well, we're getting it all</p> <p>9 straightened. We're going to be fine here.</p> <p>10 MR. HILL: Yeah, sorry for these glitches</p> <p>11 here at the beginning.</p> <p>12 All right. Let me share my screen real</p> <p>13 quickly.</p> <p>14 (Deposition Exhibit 2 marked.)</p> <p>15 BY MR. HILL:</p> <p>16 Q All right. Can you see my screen now?</p> <p>17 A Yes, sir.</p> <p>18 Q Okay. This is -- I'm going to mark this</p> <p>19 as Exhibit 2. This is your CV.</p> <p>20 And we'll note that it appears to be</p> <p>21 dated 11/20/22. Is that the most current version</p> <p>22 of your CV? It's on the last page.</p> <p>23 A It would seem to me there has been one</p> <p>24 published since 2022. So, no.</p> <p>25 Q All right. Did you bring a current copy</p>
<p style="text-align: right;">Page 11</p> <p>1 anticipation or preparation for trial or for your</p> <p>2 testimony.</p> <p>3 Other than those types of communications,</p> <p>4 have you withheld any other information requested</p> <p>5 in this exhibit that relates to this case?</p> <p>6 A No.</p> <p>7 Q And I'm assuming you have the notice</p> <p>8 there in front of you?</p> <p>9 A Yeah, and I don't know that I withheld</p> <p>10 anything. But again, I wasn't involved in the --</p> <p>11 all my engineering stuff, I brought with me.</p> <p>12 Q Right. So you basically brought</p> <p>13 everything in your file that relates to this case.</p> <p>14 And that means you produced that to Plaintiffs?</p> <p>15 A Yes.</p> <p>16 Q And you're not aware of what they may or</p> <p>17 may not have withheld in producing to us?</p> <p>18 A That's right.</p> <p>19 Q Okay.</p> <p>20 VIDEO TECHNICIAN: Counsel, can we</p> <p>21 actually go off the record briefly just to fix an</p> <p>22 audio issue real fast.</p> <p>23 MR. HILL: Sure.</p> <p>24 VIDEO TECHNICIAN: The time is 11:21. We</p> <p>25 are off the record.</p>	<p style="text-align: right;">Page 13</p> <p>1 of your CV with you today?</p> <p>2 A No. I just thought there was a current</p> <p>3 one in the file. I didn't look at my CV.</p> <p>4 Q Sure. Well, this is just the one that</p> <p>5 was produced to us in the case with your expert</p> <p>6 report.</p> <p>7 Do you know of any particular experience,</p> <p>8 education or training that would not be reflected</p> <p>9 on this CV that you're relying upon in giving your</p> <p>10 opinions today? That's all I'm trying to verify.</p> <p>11 A No. Should be no issues there at all.</p> <p>12 Thank you.</p> <p>13 Q Okay. And on this page right here, this</p> <p>14 is, I believe, the third page of your CV, about a</p> <p>15 third of the way -- or half of the way down there</p> <p>16 is a bullet point for HVE User Software Training,</p> <p>17 engineering Dynamics Corporation.</p> <p>18 So I'm assuming that's reflected that you</p> <p>19 have gone to EDC for HVE user training?</p> <p>20 A Yes.</p> <p>21 Q And when did you have that training?</p> <p>22 A Oh, in -- I've been using HVE for 30</p> <p>23 years. That may have been -- from what I remember,</p> <p>24 it's almost 20 years ago.</p> <p>25 Q All right. And did you actually go there</p>

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<p style="text-align: right;">Page 14</p> <p>1 in person for that training?</p> <p>2 A They -- I think that was -- my memory is</p> <p>3 that was in Miami. I think they came to Miami and</p> <p>4 I went to Miami.</p> <p>5 Q All right. Was that part of some larger</p> <p>6 conference in Miami or do you remember the</p> <p>7 circumstances surrounding that training?</p> <p>8 A No, it was just for that. I went to, you</p> <p>9 know, day training from HVE. That was -- that was</p> <p>10 what it was.</p> <p>11 Q Sure. And you said it was approximately</p> <p>12 20 or so years ago?</p> <p>13 A Yes, sir.</p> <p>14 Q All right. Have you received any</p> <p>15 additional training on the use of HVE since that</p> <p>16 time?</p> <p>17 A I don't really remember. We use it. I</p> <p>18 try to stay update. I'll -- if we need some</p> <p>19 information me and the staff will research.</p> <p>20 They have different forums. My junior</p> <p>21 engineers will go to forums and then we'll talk</p> <p>22 about, you know, what they did.</p> <p>23 So I mean, I've -- I've stayed abreast</p> <p>24 with it as far as using it, but I don't think I've</p> <p>25 actually gone to any seminars personally since</p>	<p style="text-align: right;">Page 16</p> <p>1 running. I'll go in and check it.</p> <p>2 I'll -- sometimes I'll sit down and make</p> <p>3 adjustments or to do some, I guess, experimenting</p> <p>4 with it to see what's -- what's going on with any</p> <p>5 particular accident we're using it in. But most</p> <p>6 time I have a junior engineer doing, you know, the</p> <p>7 vast majority of -- of the keystroking and</p> <p>8 everything.</p> <p>9 Q Okay. And describe what keystroking is</p> <p>10 kind of involved with HVE just at a -- so the jury</p> <p>11 can understand it or I can understand it. So what</p> <p>12 type of inputs are needed in order to run the</p> <p>13 simulation, just in general?</p> <p>14 A Well, it's got a lot of different modules</p> <p>15 and things, but, you know, all of them are going to</p> <p>16 start with you got to select a vehicle, you have to</p> <p>17 modify a vehicle, you have to check the CG's in the</p> <p>18 right location, might change the tire size.</p> <p>19 Then when you go in and you start</p> <p>20 actually running your -- your impacts, you have to</p> <p>21 position the two vehicles. And that's -- you use</p> <p>22 your -- that's the engineering judgment where first</p> <p>23 contact is and their orientations and their speeds.</p> <p>24 All of that is put in with keystrokes.</p> <p>25 And then once you -- once you get it</p>
<p style="text-align: right;">Page 15</p> <p>1 then.</p> <p>2 I mean, I was using it for 10 years</p> <p>3 before I ever went to a seminar, so it's really a</p> <p>4 pretty straightforward program.</p> <p>5 Q Sure. How did you learn how to use it</p> <p>6 without going to any type of training?</p> <p>7 A I'm an engineer. You know, most of the</p> <p>8 programs I've used in my life didn't come with --</p> <p>9 you didn't go to seminars, you learn how to use</p> <p>10 them. You investigate them. They follow physics.</p> <p>11 HVE's -- been a lot of updates. I still</p> <p>12 call it EDSMAC and EDCRASH because that's what they</p> <p>13 were way back in the day.</p> <p>14 But, you know, it's -- it's an iterative</p> <p>15 process that they keep updating. And as long as</p> <p>16 you keep using it and keep working with it, you're</p> <p>17 basically, you know, eating the elephant in small</p> <p>18 bites. I wouldn't mind going to a course but I</p> <p>19 haven't needed to.</p> <p>20 Q Okay. And when you use HVE, do you run</p> <p>21 the simulations yourself and provide the input or</p> <p>22 is that something your staff does?</p> <p>23 A I'll talk to staff. I generally if I</p> <p>24 need to show them some stuff, I will. But</p> <p>25 generally I'll let them set it up and get it</p>	<p style="text-align: right;">Page 17</p> <p>1 where it can run a simulation and it hits the</p> <p>2 vehicles together, then you look at what happens</p> <p>3 and the outputs.</p> <p>4 And the outputs a lot of times aren't</p> <p>5 exactly what you expected or what you wanted, so</p> <p>6 you start making adjustments.</p> <p>7 And in this case, the adjustments were we</p> <p>8 knew the impact speed of the truck and we knew the</p> <p>9 delta-V of the truck.</p> <p>10 So we had to make -- we had to do a</p> <p>11 little bit of tuning, which is the keystrokes,</p> <p>12 where you change some of the parameters until you</p> <p>13 see something that represents the accident that</p> <p>14 you're trying to investigate.</p> <p>15 But -- and so -- and in this case the</p> <p>16 scene is very simple, it's a flat scene. There</p> <p>17 really isn't a scene, so we don't have to -- a lot</p> <p>18 of times you'll be adjusting the scene and slopes</p> <p>19 and, you know, where things are.</p> <p>20 But in this case we're not doing --</p> <p>21 really needing to do any of that. I mean, it's</p> <p>22 just about the size of the vehicles, how they hit,</p> <p>23 their velocity vectors, when they hit and then a</p> <p>24 little bit of adjusting like in this case, things</p> <p>25 like the coefficient of restitution to -- to tune</p>

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<p style="text-align: right;">Page 18</p> <p>1 it and then get everything right.</p> <p>2 Q Thanks. And we'll go into all of that in</p> <p>3 detail later.</p> <p>4 Did you use HVE to try to simulate the</p> <p>5 accident that happened in this case?</p> <p>6 A No.</p> <p>7 Q Okay. And have you in the past when</p> <p>8 you've used HVE to explore a hypothetical accident</p> <p>9 that's different from the accident that you're</p> <p>10 investigating, have you run a baseline HVE test to</p> <p>11 try to simulate the actual accident? Have you ever</p> <p>12 done that?</p> <p>13 A That's a big question. And I think -- I</p> <p>14 think it boils down to, the simplified version,</p> <p>15 have we ever used HVE to simulate an actual</p> <p>16 accident, the answer is yes.</p> <p>17 Q And what would be your reasoning for</p> <p>18 simulating an actual accident using HVE when you</p> <p>19 actually know what happened in the accident?</p> <p>20 A Well, I'm -- I'm -- I -- you really</p> <p>21 confused me with that question.</p> <p>22 Q All right. Let me -- let me try to</p> <p>23 rephrase it. Sorry about that.</p> <p>24 A Sure.</p> <p>25 Q Part of your analysis of any accident is</p>	<p style="text-align: right;">Page 20</p> <p>1 reconstruct the speeds.</p> <p>2 So HVE is very helpful when you're --</p> <p>3 when you're missing some information.</p> <p>4 Well, in this case we're really not</p> <p>5 missing any information about the accident. We</p> <p>6 kind of know everything. We don't need HVE.</p> <p>7 But if we want to say what would happen</p> <p>8 if the truck looked different, then that's where</p> <p>9 HVE is very helpful. And that's what we used it</p> <p>10 for here, but...</p> <p>11 So there's -- there's crashes that we</p> <p>12 need HVE to fill in some of the blanks, but then</p> <p>13 there's other crashes where we don't need HVE. And</p> <p>14 so, therefore, we don't use it.</p> <p>15 Q Other than determining the speed of the</p> <p>16 vehicles when you don't know it, what other uses</p> <p>17 would there be for HVE and simulating an actual</p> <p>18 accident? What other data can it provide?</p> <p>19 A I'm sorry, I spoke over you. I think I</p> <p>20 heard your whole question, but ask it again.</p> <p>21 Q Sure. So you indicated that one reason</p> <p>22 to run the HVE simulation on an accident that</p> <p>23 you've actually -- that actually occurred would be</p> <p>24 it could tell you the speeds when you don't know</p> <p>25 the speeds in the accident.</p>
<p style="text-align: right;">Page 19</p> <p>1 to actually physically look at the vehicles</p> <p>2 involved, look at the scene and use that</p> <p>3 information to recreate the accident, correct?</p> <p>4 That's sort of Step 1?</p> <p>5 A Reasonably. Reasonably. We call it</p> <p>6 reconstruct the accident, yes.</p> <p>7 Q Yeah. And if you can do that using the</p> <p>8 actual physical evidence from the actual accident,</p> <p>9 why would you need to run an HVE simulation of the</p> <p>10 actual accident?</p> <p>11 A Okay. I think I understand your</p> <p>12 question.</p> <p>13 If we just look at the physical evidence,</p> <p>14 we can tell where vehicles hit and tell where</p> <p>15 vehicles move, but we can't always tell the speed</p> <p>16 at which the vehicles hit.</p> <p>17 And that's where HVE would be very</p> <p>18 beneficial is to test different speeds and to see</p> <p>19 which speeds match the physical evidence. They</p> <p>20 don't always perfectly match but, you know, within</p> <p>21 reason.</p> <p>22 However, in a case where we know the</p> <p>23 speeds, say in this one because we have the speeds</p> <p>24 recorded by the electronic data in the pickup</p> <p>25 truck, we don't need a simulation program to</p>	<p style="text-align: right;">Page 21</p> <p>1 What are some other reasons you would run</p> <p>2 an HVE on an actual accident? What are some other</p> <p>3 information you can glean from that that you can't</p> <p>4 get from investigating the actual accident?</p> <p>5 A Rotation rates can be hard to get.</p> <p>6 Accelerations at different parts of the vehicles</p> <p>7 can sometimes be hard to hand calculate.</p> <p>8 I mean, you can use some -- some Euler</p> <p>9 mechanics calculations, but those are -- those are</p> <p>10 -- can be pretty tough to do.</p> <p>11 So sometimes it's just a convenient way</p> <p>12 to fill in some of the more subtle blanks of what a</p> <p>13 vehicle is doing.</p> <p>14 And sometimes it's just because you want</p> <p>15 to visualize it, you want to -- you want to kind of</p> <p>16 -- you've done all your calculations and say, okay,</p> <p>17 well, we think this evidence means this, let's run</p> <p>18 an HVE to give us a quick visualization check on --</p> <p>19 on what our brain is telling us.</p> <p>20 So it's got some advantages depending on</p> <p>21 the situation.</p> <p>22 Q I believe you indicated that, you know,</p> <p>23 it's obviously only as good as the input you put</p> <p>24 in. And then sometimes you need to tweak those</p> <p>25 inputs to get the result that you're looking for;</p>

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<p style="text-align: right;">Page 22</p> <p>1 is that fair?</p> <p>2 A That was specifically for this case</p> <p>3 because we -- we had -- we knew -- we knew the</p> <p>4 inputs and the outputs with respect to speed, but</p> <p>5 the program didn't admittedly match the input speed</p> <p>6 with the output speed or the delta-V.</p> <p>7 And that's because the program didn't</p> <p>8 have the co-efficient of restitution quite right.</p> <p>9 Because it comes with defaults and we had to work</p> <p>10 on that a little bit to -- so that the mathematical</p> <p>11 equations would -- would get from the beginning to</p> <p>12 the end properly. So we had to get a little</p> <p>13 guidance.</p> <p>14 Q So to make sure I understand that, was it</p> <p>15 the use of the default coefficient of restitutions</p> <p>16 by the software the reason why the input and output</p> <p>17 delta-Vs didn't match?</p> <p>18 A Essentially, yes.</p> <p>19 Q Was there any other aspect of the initial</p> <p>20 run that you think contributed to the inputs and</p> <p>21 outputs not matching?</p> <p>22 A No.</p> <p>23 Q Okay. And in tweaking the coefficients</p> <p>24 of restitution, and we'll get into this later, I</p> <p>25 believe you had to look that up somewhere, correct?</p>	<p style="text-align: right;">Page 24</p> <p>1 together for a total restitution of -- of the</p> <p>2 accident.</p> <p>3 So we do a -- so it's -- it's for the</p> <p>4 crash. It's not for each car. It's for a crash.</p> <p>5 Because if you hit the cars in a</p> <p>6 different orientation, you -- you would -- you</p> <p>7 would probably get a slightly different answer on</p> <p>8 that.</p> <p>9 So it's -- it's how much the -- the</p> <p>10 vehicles rebound and how much they -- they -- they</p> <p>11 spring off of each other, if you will.</p> <p>12 They don't stick together perfectly, they</p> <p>13 actually work to try to -- they bend -- like you</p> <p>14 take a paper clip and bend it, then you let it go,</p> <p>15 it springs open a little bit. The metal bends in</p> <p>16 and it wants to spring out a little bit.</p> <p>17 And that's -- that's the -- the part that</p> <p>18 nobody really knows about a crash or exactly</p> <p>19 precisely sure. And that's one of those things</p> <p>20 that you have control over to try to refine your</p> <p>21 analysis.</p> <p>22 Q And thanks for that explanation.</p> <p>23 So you can't really calculate that</p> <p>24 combined coefficient of restitution? I think</p> <p>25 that's what you just meant by the -- the very end</p>
<p style="text-align: right;">Page 23</p> <p>1 Did you get that from Neptune Engineering</p> <p>2 for on one -- at least one of the vehicles?</p> <p>3 A No, no, no. That's just -- that's just a</p> <p>4 tuning within the program. That's -- once you run</p> <p>5 it, the outputs were precisely matching the EDR</p> <p>6 data in the truck.</p> <p>7 So we -- we tuned effectively the</p> <p>8 coefficient of restitution to -- to get it to</p> <p>9 match.</p> <p>10 Q And just so I understand this, the</p> <p>11 coefficient of restitution of what?</p> <p>12 A Of the collision. It's --</p> <p>13 Q So that's not of the roadway?</p> <p>14 A Right.</p> <p>15 Q Not -- and it's -- is it of both</p> <p>16 vehicles? When you say "the collision," just so I</p> <p>17 understand it, what do you mean?</p> <p>18 A It's a property of the -- let me see if I</p> <p>19 want to use the right word, property.</p> <p>20 It's a product of the collision of the</p> <p>21 two vehicles. They would independently have a</p> <p>22 restitution associated with them if they ran into</p> <p>23 an immovable barrier wall.</p> <p>24 And when they hit each other, the</p> <p>25 restitutions were of each individual and worked</p>	<p style="text-align: right;">Page 25</p> <p>1 of that answer.</p> <p>2 A Yes.</p> <p>3 Q What -- the way you can determine it is</p> <p>4 by manipulating that combined coefficient of</p> <p>5 restitution in the program until it outputs the</p> <p>6 appropriate delta-Vs for both input and output; is</p> <p>7 that a fair way to put that?</p> <p>8 A Right, when you know the delta-Vs.</p> <p>9 Now, you can -- if you don't know them,</p> <p>10 you can use a default in the program or you can use</p> <p>11 a range. But in this case we knew them, we knew --</p> <p>12 we knew the two values. We -- we knew the</p> <p>13 beginning and ending.</p> <p>14 We -- we knew the beginning speed of the</p> <p>15 truck and the delta-V of the truck, so we know the</p> <p>16 ending speed.</p> <p>17 And the -- the tool to allow the -- those</p> <p>18 -- all those numbers to match up is the</p> <p>19 restitution.</p> <p>20 Q Gotcha.</p> <p>21 And you knew that from the download from</p> <p>22 the truck?</p> <p>23 A Yes, yeah. The -- the truck measured the</p> <p>24 crash for us, so.</p> <p>25 Q Right.</p>

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<p style="text-align: right;">Page 26</p> <p>1 A It really did -- did a lot of what HVE 2 might normally do for us if we needed it. We don't 3 -- or if we needed it. But in this day and age, 4 the truck measures it for us. 5 Q Sure. Now, is there anything preventing 6 you from using HVE to first simulate the actual 7 crash in this case? 8 If you are to do that using the actual 9 vehicles involved in this case, wouldn't that 10 generate a coefficient of restitution for the 11 actual accident that would be consistent with the 12 inputs and the outputs? 13 A Well, that's two questions in there. 14 First, HVE would be quite suspect anyways starting 15 out trying to reconstruct this crash because of the 16 amount of -- I call it the -- the truck exploded 17 the rear of the car. 18 The -- the way that the -- that the 19 unibody rails bend down, the way that the wells 20 unzip, the way that metal was torn, the way that 21 the hatch was actually caved in. 22 You've actually defeated the structure of 23 the Escape so much that I would be worried about it 24 following HVE's, let's just say, thought process. 25 There's a -- in HVE, it's -- they're</p>	<p style="text-align: right;">Page 28</p> <p>1 were using it on SV -- for two vehicles that hit as 2 vehicles should reasonably strike each other, 3 meaning bumper to bumper, structure to structure. 4 So, you know, in the development of the 5 program, it's clearly that -- that crash was 6 contemplated. So we feel very comfortable about 7 that. It's a robust platform to do that with. 8 I didn't say that it couldn't be used for 9 the other, I said I would be very suspect of it 10 because of the factors I gave you. And I would say 11 we didn't need to. 12 In other words, it would be -- for our 13 purposes, it wouldn't add any knowledge, we already 14 had all the knowledge. So we'd basically be adding 15 uncertainty on to certainty by trying to use HVE to 16 that. 17 So I -- I would be suspect of doing it 18 because of a -- but I didn't need to do it, and 19 that's why we didn't do it. 20 Q So would you be critical of an approach 21 taken by others in your field that they would 22 always use HVE to simulate the actual crash first 23 to create a baseline report that would make sure 24 that the inputs that you used in the hypothetical 25 crash were consistent with the actual crash?</p>
<p style="text-align: right;">Page 27</p> <p>1 trying to model a vehicle that will follow -- that 2 will act like a vehicle. 3 I'm not so sure that the -- all the 4 damage on the back of the Escape would make it 5 robust to use an HVE simulation of the way it was 6 damaged in the accident. 7 The best answer to the question, I didn't 8 need to because I can measure everything and I can 9 have all of that. I have everything I need about 10 the accident form the truck or the damage. 11 But if your question is, and I think it 12 was, why didn't we do HVE or why wouldn't we, well, 13 I would be very concerned that it would be actually 14 representative. 15 Q And what differentiates an HVE of the 16 actual accident from the HVE simulation that you 17 ran using a -- a model stock 2015 F250? 18 So obviously, you're -- you're going to 19 testify here that the HVE simulation that you ran 20 of a hypothetical incident is reliable and is 21 valid, but I think you've just said that you would 22 not feel that way if you try to model the actual 23 accident. So what's the difference between the 24 two? 25 A Okay. Well, first, when we used HVE we</p>	<p style="text-align: right;">Page 29</p> <p>1 MS. CANNELLA: Object to the form of the 2 question as it assumes facts not in evidence. 3 A Yeah, and there's two -- there were two 4 questions there. 5 The first one is, if someone says they're 6 always going to use HVE for everything. I'm like, 7 well, close the door, I don't even want to -- 8 that's a -- to me that's crazy. 9 HVE is not that good of program. It's 10 got things that can be used for and things it can't 11 be. It's like all the other calculation tools we 12 have. 13 If you're -- if that's what you think, is 14 that I can use it for everything to be 15 representative, many times HVE just -- we know all 16 the evidence, but when we start looking at 17 something in it, it -- it can't handle it. It 18 can't handle it. 19 But clearly, in a straight-on rear 20 collision, bumper to bumper, it's -- it's a -- it's 21 a wonderful tool as we use. It's just one of the 22 tools that we use. 23 But if -- if -- to say -- to give it the 24 amount of deference that's in your question, it's 25 like, oh, HVE knows physics better than physics</p>

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<p style="text-align: right;">Page 30</p> <p>1 does. HVE knows reality better than reality does.</p> <p>2 I would disagree with that. I would say,</p> <p>3 hmm, that's -- maybe I'm misunderstanding</p> <p>4 something, but I would not respect that approach</p> <p>5 with the absolutism that you gave it.</p> <p>6 BY MR. HILL:</p> <p>7 Q I appreciate that answer, and I guess I</p> <p>8 phrased the question poorly.</p> <p>9 Let's say you had an environment where</p> <p>10 you believe HVE was a proper tool. You just kind</p> <p>11 of said it's limited.</p> <p>12 A I didn't hear one of the words. If you</p> <p>13 can ask that again, so I don't have to go back. Or</p> <p>14 say it again.</p> <p>15 Q Yep.</p> <p>16 So let's say you have a bumper-to-bumper,</p> <p>17 rear-end collision like you've just described where</p> <p>18 you feel like the HVE program is sufficient to</p> <p>19 actually use to analyze the crash.</p> <p>20 All right, so let's assume that's the</p> <p>21 case. And let's say you wanted to change the</p> <p>22 bumper height on one of the vehicles so that it</p> <p>23 would still be a bumper-to-bumper impact, correct?</p> <p>24 So it would still be a situation where you feel</p> <p>25 like HVE would be a valid tool.</p>	<p style="text-align: right;">Page 32</p> <p>1 You know, there are several different</p> <p>2 wrenches you can turn a nut with. You know, a</p> <p>3 box-end wrench is going to be a whole lot better</p> <p>4 than a crescent wrench. But sometimes a crescent</p> <p>5 wrench is a better one because -- for whatever</p> <p>6 reason. I don't know until I look at the nut.</p> <p>7 I'm not going to know until I look at the</p> <p>8 accident. So I -- I would say I don't know.</p> <p>9 Q Well, I think you've indicated that with</p> <p>10 this tool, this wrench, you have to calibrate it</p> <p>11 properly in order for it to be effective. Do you</p> <p>12 agree with that?</p> <p>13 A Yeah, a crescent wrench you've got to</p> <p>14 make -- you've got to adjust it tight to fit the</p> <p>15 nut or it's not going to work.</p> <p>16 Q Right. And what --</p> <p>17 A Same thing with any program, you're going</p> <p>18 to have to -- you have to -- it's just called</p> <p>19 tuning when you're doing your simulation. It can't</p> <p>20 know everything. We have to give it some more</p> <p>21 information sometimes.</p> <p>22 Q Right. And one way to learn what the</p> <p>23 proper -- appropriate tuning would be would be to</p> <p>24 tune it until it properly simulates the actual</p> <p>25 crash involved. That would be one way to tune it,</p>
<p style="text-align: right;">Page 31</p> <p>1 Let's say in that situation, where it</p> <p>2 could properly model both the actual crash and the</p> <p>3 hypothetical crash when conditions changed.</p> <p>4 In that situation would you agree that it</p> <p>5 would be smart to do a baseline HVE simulation of</p> <p>6 the actual crash in order to make sure that it can</p> <p>7 properly simulate what you know happened before you</p> <p>8 try to simulate a hypothetical crash?</p> <p>9 A I would say you wouldn't know unless you</p> <p>10 showed me the crash and let me look at what you</p> <p>11 were talking about.</p> <p>12 I mean, that's -- that's -- that's --</p> <p>13 that absolutism, oh, it must be okay. We don't</p> <p>14 know until we see -- until we see the evidence and</p> <p>15 see what it is.</p> <p>16 HVE is nothing more than a tool that we</p> <p>17 have available to us along with other tools.</p> <p>18 So I -- the question can't be answered.</p> <p>19 It has -- we have to see the crash and have to know</p> <p>20 what the data is and what we're looking at.</p> <p>21 Because it may and may not be able to do it.</p> <p>22 Q Well, it would have --</p> <p>23 A I don't let HVE make the decisions for</p> <p>24 me, I make the decisions. HVE is just a tool.</p> <p>25 It's like a wrench.</p>	<p style="text-align: right;">Page 33</p> <p>1 correct?</p> <p>2 A No, not in this case. That would --</p> <p>3 because -- look, you're -- that's the apples and</p> <p>4 oranges comparison that -- it doesn't work.</p> <p>5 Because in the accident the tailgate, in</p> <p>6 the backseat of the car in the pillars, the C</p> <p>7 pillars, or maybe it's the D pillars, absorb the</p> <p>8 energy, not the frame of the vehicle or the -- or</p> <p>9 the unibody in the rails.</p> <p>10 So to say that -- that we have to trick</p> <p>11 -- because it would be tricking, I think -- HVE</p> <p>12 into making that crash happen because I don't think</p> <p>13 it's really built for that crash.</p> <p>14 I don't -- I think that's -- when the</p> <p>15 truck gets so high above the bumper, as I told you</p> <p>16 earlier, I would be very suspect to even try and</p> <p>17 use it. And then say you have to do that.</p> <p>18 We have all of that data. We know what</p> <p>19 that information is. We want to use HVEs for</p> <p>20 something that's appropriate.</p> <p>21 And I don't -- I'm not -- I'm not saying</p> <p>22 you wouldn't learn something from it, but you would</p> <p>23 never learn anywhere near what we already know</p> <p>24 because of the -- the data that we have from the</p> <p>25 truck and the physical evidence we can see.</p>

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<p style="text-align: right;">Page 34</p> <p>1 That would be a -- for me it would be a 2 useless endeavor and one fraught with -- fraught 3 with -- with danger that you would get that 4 information. 5 But if someone wants to do it, I'm happy 6 with them doing it. I just don't think that would 7 be appropriate at all. 8 Q So the distinction there is that if you 9 have bumper override and impact up -- that's above 10 the bumper in any way, are you saying that that 11 creates a situation where HVE is no longer 12 something you would rely upon because it just can't 13 handle that type of situation? Is that kind of -- 14 a way to describe that? 15 A No, I told you about this earlier in the 16 first time you asked the question. 17 The first bumper came off, the bumper bar 18 came off of it, of the car. The -- the unibody 19 rails, one went down, one went in. We lost a lot 20 of the welds at the back. 21 So I think that the -- the back structure 22 of this vehicle wasn't performing anything like 23 what we imagined a car would actually perform. 24 It's outside of what a design or a 25 computer program, you know, in my opinion, would be</p>	<p style="text-align: right;">Page 36</p> <p>1 order for it to be useful and reliable to you, if I 2 understand what you're saying, it's dependent upon 3 there being bumper to bumper or frame to frame 4 impact? 5 A No, no, you are dutifully trying to go 6 outside of my answer with this. 7 It's -- it's a normal vehicle-to-vehicle 8 collision. The vehicles acting fairly normal if we 9 can get the truck to stay at the stock height. 10 It's -- it's well within the -- what the 11 program is made to do, which we really appreciated. 12 It's made to handle a vehicle-to-vehicle collision 13 that's reasonable. 14 The accident wasn't reasonable. And the 15 -- and the structure of the car didn't perform 16 like -- anything like what it was reasonably 17 intended to do because the head was so high and it 18 defeated, you know, basically the structure of the 19 car. 20 It's a unibody car that's no longer a 21 unibody car anymore, it's -- it's piecemeal. It's 22 torn apart. Pieces are hanging off of it. It just 23 -- it just falls outside of what a car reasonably 24 should be expected to do in a crash. 25 And if a car can't reasonably expect it,</p>
<p style="text-align: right;">Page 35</p> <p>1 taking into consideration in -- in putting one 2 that's -- you're going to be crashing vehicles that 3 should act somewhat like the structures they were 4 designed to be. So that's really my complaint. 5 I've -- I've given other examples as we 6 go along. But, you know, you can drive a nail with 7 a crescent wrench and it goes in, but that doesn't 8 mean you should be driving nails with crescent 9 wrenches. 10 I think that's what could be going on 11 here, is you could -- you can always get an answer 12 out of HVE, but I don't know what the answer would 13 be good for. 14 Because it's -- you know, it's -- one, we 15 don't need it; and second, it's taking it outside 16 of areas where I'd be comfortable that it would 17 reliably tell you something. 18 And it might tell you a few things. I 19 mean, if you just look at the momentum of it and 20 things like that. 21 But as far as understanding the crash the 22 way I need to, I don't -- I don't think it would be 23 a good choice. 24 Q All right. So the HFE -- or HVE, sorry, 25 simulation that you ran was dependent upon -- in</p>	<p style="text-align: right;">Page 37</p> <p>1 how can we expect a computer program written to -- 2 to analyze car crashes to handle that, that's my -- 3 that's my real issue. 4 And I've answered it about four different 5 ways now. I don't have anything else to tell you 6 on this. 7 You're asking me about a hypothetical can 8 we use HVE to do -- to stimulate the actual 9 accident? And I'm like I would be suspect. I've 10 given you a lot of reasons. I wouldn't -- I -- 11 Q I'm sorry that we're misfiring. 12 A I initially -- 13 Q Yep. If I'm not ans -- asking it 14 appropriately, but I'm just trying to find out. 15 And -- and I'll move on and we'll talk 16 about this more in detail later, I guess. 17 But you've made the distinction between a 18 normal anticipated accident, which is how you're 19 describing your simulation of a stock 2015 F250 20 being involved in this accident instead of the 21 subject F250. 22 And you've kind of said, okay, with a 23 stock one, I can rely upon HVE because that creates 24 a crash that the program would expect. Have I 25 correctly stated that?</p>

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<p style="text-align: right;">Page 38</p> <p>1 A No, no. You -- parts of it are stated. 2 But I just need to reiterate, we didn't need an HVE 3 for the crash that happened because we have 4 everything we need. 5 HVE was just a tool to analyze what 6 should have happened without a lifted truck. 7 That's all it was. 8 We're having this whole conversation 9 which is actually something I never really had to 10 have. 11 You're -- you're -- I'm just being -- I'm 12 answering your questions, they weren't mine. I 13 don't need HVE for what you're asking it about. 14 And I never even -- I'm just answering -- 15 I'm -- you have to tell the answers honestly now 16 because I'm -- I'm an engineer. 17 But the fact is, I didn't need HVE for 18 the accident because it add -- would add nothing. 19 What I needed HVE was to run what should have 20 happened. Period. 21 All -- this whole debate, we've been 22 going for, you know, 45 minutes, is about -- about 23 something that is outside of our work. I'm just 24 trying to answer your questions. 25 Q Well, I don't mean to be debating</p>	<p style="text-align: right;">Page 40</p> <p>1 you can't. 2 And I've already answered, we -- we look 3 at each individual case by itself and we make 4 judgments there of all the tools we have. 5 So in this case I knew that it would be 6 reasonable with stock cars to run HVE and that's 7 the only decision I had to make and that's the only 8 one I did make. 9 Q Sure. Let me ask it this way: Do you 10 have any support -- or would you agree that this 11 was a complex crush-type situation that you're 12 analyzing here? 13 A What -- what part are you talking about? 14 Q So if you're going to anal -- use HVE to 15 -- what -- the tool -- the reason you use it in 16 this case is to assist you in determining what type 17 of crush would have been experienced under the 18 hypothetical simulation that you ran using a stock 19 F250, right? 20 A We -- it was one of the tools to predict 21 what the crush would have been with a stock F250, 22 yes. 23 Q Right. And would you agree that the 24 crush with a stock 250 is a complex crush that 25 you lay?</p>
<p style="text-align: right;">Page 39</p> <p>1 anything. And I'm not talking about using HVE 2 anymore to simulate the actual crash. 3 I'm talking about the parameters under 4 which you believe HVE is appropriate. And you've 5 described the simulated HVE work that you ran here 6 as one of the circumstances where it's appropriate 7 because there's bumper-to-bumper contact that you 8 -- that you believed the program would expect. Is 9 that fair to say? 10 I'm just saying that's why you believe it 11 was appropriate in the simulation you did in this 12 case? 13 A No, no, you're -- you're -- you've still 14 got a twist to it that's not appropriate. 15 Q Okay. 16 A Basically -- basically we looked at the 17 cars and said, guys, if these were reasonable stock 18 cars, how can we tell what the crush would be? 19 One of the tools we used was HVE, but 20 that was just a, you know, choice. We didn't 21 choose it -- we're not -- I'm not trying to 22 categorize use HVE in bumper-to-bumper crashes. 23 That's what you're trying to get me to do 24 is to go -- is to -- is to talk about HVE as a 25 universal, you know, when you can use it and when</p>	<p style="text-align: right;">Page 41</p> <p>1 A Not any more complex than what we do 2 every single day. It's -- to us it's not 3 particularly complex, but maybe -- maybe to others 4 it is. 5 It's -- this is just a standard ho hum 6 every single day. We -- this is what we do. It's 7 not complex. 8 Q Well, let me put it another way: Do you 9 have any support that you can cite to that would 10 validate your use of HVE to calculate or determine 11 crush in a hypothetical incident? 12 A Sure. I keep two of these books back 13 here. This is just so I can give one to the staff 14 when they come in and they have all their own 15 books. 16 This is Traffic Crash Reconstruction by 17 Lynn Fricke from the Northwestern Traffic 18 Institute. 19 This is the first book that I have 20 everyone go to in my office to -- as a good primer. 21 It talks about HVE and the robustness of it. And 22 it talks about crush and modeling the vehicles in 23 it. 24 So it's -- that's -- that's what I think 25 is the premier training organization. And they --</p>

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<p style="text-align: right;">Page 42</p> <p>1 you know, they -- they reference it and they 2 recommend it. 3 Q You're saying that book is going to say 4 that HVE can be used to model complex crush 5 situations? 6 A Yes. 7 Q All right. 8 A Accident reconstruction, it uses crush. 9 It references the programs that we used here, yes. 10 Q Sure. Now, I know that components of 11 HVE, while we're on it, would be the SIMON 12 software? 13 A Yes. 14 Q And whenever you use SIMON, you also need 15 to use the DyMESH model? 16 A That's how we do it, yes. I don't think 17 you always do, but yes. 18 Q And have you had any specific training in 19 SIMON or DyMESH? 20 A Other than using it for years, no, sir. 21 Q Okay. So you've not gone to any classes 22 or anything related to that software? 23 A No. If we need something, we'll contact 24 them and we'll talk to them, but no. 25 Q Sure. Let me change my screen here.</p>	<p style="text-align: right;">Page 44</p> <p>1 getting at is, with my questions I don't want them 2 to be limited just to trial or deposition cases. 3 But from this list or from your other 4 cases not on this list in this time period, did any 5 of them involve an analysis of an accident 6 involving lifted vehicle? 7 A I don't know of any off the top of my 8 head, but I have a hard time believing that there 9 weren't lifted vehicle in some of these accidents. 10 Q But as we sit here today, you don't 11 recall a specific case where you worked on that did 12 involve a lifted vehicle in the accident? You 13 can't recall one specifically? 14 A I mean, no, I didn't prepare for that and 15 I -- just sitting here, I don't remember. 16 I mean, I'm thinking -- I'm not able to 17 sit here and quickly recall that. I'm sure I've 18 done some. I'm just focused in on this case for 19 this deposition and that's where my mind is. I'm 20 -- I'm focused here but -- and if I think of one, 21 I'll tell you. 22 Q Sure. So obviously you don't recall any 23 time in the past where you've ever testified that 24 the lift -- the lifted vehicle contributed in any 25 way to increased intrusion or crush in the vehicle</p>
<p style="text-align: right;">Page 43</p> <p>1 Hold on. 2 Sorry, I didn't mean to be sharing it the 3 whole time there. 4 A I'm only look -- I've got you in a little 5 box in the corner, so it doesn't matter at all. 6 Q All right. All right. I've shared your 7 testimony list. We'll mark that as Exhibit -- I 8 guess we're on No. 3. 9 A Yes. 10 (Deposition Exhibit 3 marked.) 11 BY MR. HILL: 12 Q And I think this goes back to September 13 of 2020. 14 Are you aware of any of these cases where 15 you -- and these are just cases where you've given 16 trial or deposition testimony, correct? 17 A Yes. 18 Q And so, you could work as a consulting 19 expert on many other cases where you don't get 20 trial or deposition testimony that are not on this 21 list? 22 A Sure. Most of -- majority of our work -- 23 majority of our work doesn't ever require a 24 deposition or trial, so it's not listed. 25 Q Right. And that's what I'm kind of</p>	<p style="text-align: right;">Page 45</p> <p>1 that it hit? That's what I'm trying to get at. 2 A No, I -- probably not. Basically I just 3 say here's what it is. You know, in other words, 4 I'm not really -- I'm pretty much just a facts guy, 5 here's what happened, here's where it is. 6 You know, so it -- it just come out like 7 car A hit car B and this is the crush. 8 Q Sure. 9 A I don't remember specifically. I'm sure 10 I've been asked a lot, well, if it didn't override 11 what would it look like or something like that, but 12 I just don't remember any of those cases. 13 Normally it's just what it is. It is 14 what it is. 15 Q Well, speaking to that, how many of the 16 cases that you can recall within this time period 17 that you investigated involved override, as you've 18 just described it? 19 A Well, override, you know, can happen, 20 especially with an 18-wheeler. A vehicle run into 21 the rear of an 18-wheeler, the side of an 22 18-wheeler. You can also get -- run into objects 23 and cause override. Sometimes you've got multiple 24 impacts where vehicles get -- you know, get 25 changed.</p>

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<p style="text-align: right;">Page 46</p> <p>1 So, you know, override is something that</p> <p>2 we in some shape, form, or fashion deal with a fair</p> <p>3 amount.</p> <p>4 Q Sure. So it can happen without the</p> <p>5 necessity of one of the vehicles being -- having a</p> <p>6 lift kit installed? You can have override in a lot</p> <p>7 of different situations?</p> <p>8 A Yes.</p> <p>9 Q All right. From this list and from your</p> <p>10 general experience, can you give me a breakdown,</p> <p>11 and I know you get asked this question in every</p> <p>12 deposition, but the percentage of the cases you</p> <p>13 work on that are for -- or where you're retained by</p> <p>14 lawyers for the plaintiff versus the number of</p> <p>15 cases where you're retained by lawyers for the</p> <p>16 defense?</p> <p>17 A It's a 50/50 breakdown. We got as many</p> <p>18 plaintiff projects that I have defense cases over</p> <p>19 the years and we maintain it about that at any</p> <p>20 time.</p> <p>21 Q Right. And so you would -- your</p> <p>22 testimony would be from this testimony list you</p> <p>23 would estimate that 50 percent of the cases on this</p> <p>24 list you testified on behalf of the defense and 50</p> <p>25 percent on behalf of the plaintiff.</p>	<p style="text-align: right;">Page 48</p> <p>1 can recall?</p> <p>2 MS. CANNELLA: Object to the form of the</p> <p>3 question as a compound question.</p> <p>4 BY MR. HILL:</p> <p>5 Q Well, I just tried to make it simple in</p> <p>6 one question, but I can ask it individually if you</p> <p>7 want, if you don't understand it.</p> <p>8 A On here, three or four, is my guess with</p> <p>9 you.</p> <p>10 Q Right. So you don't know specifically</p> <p>11 how many, but your guess would be three to four?</p> <p>12 A Yes.</p> <p>13 Q All right. And just with Ms. Cannella's</p> <p>14 firm, her new firm, how many cases have you worked</p> <p>15 on with her?</p> <p>16 A I don't know. I don't -- I didn't pay a</p> <p>17 lot of attention. I still have -- the original</p> <p>18 group grouped in my mind, so I don't -- and I don't</p> <p>19 know what happened to the projects that they had</p> <p>20 and how they split them up or anything.</p> <p>21 So I know of this project and I can think</p> <p>22 of one other that I've worked on. But there might</p> <p>23 be more.</p> <p>24 Q Do you know of any other that you are</p> <p>25 currently working on?</p>
<p style="text-align: right;">Page 47</p> <p>1 And I'm not holding you to an exact</p> <p>2 percentage, but that's your testimony and probably</p> <p>3 your recall of your role in these cases?</p> <p>4 A Yes.</p> <p>5 Q Okay.</p> <p>6 A Just because that's -- that's how we</p> <p>7 manage the work when it comes in. So it goes out</p> <p>8 the same way it comes in usually.</p> <p>9 Q So how do you manage that? I mean, you</p> <p>10 can't control who calls you and asks you for your</p> <p>11 help. So do you actually limit the number of cases</p> <p>12 you'll take from one side or the other in order to</p> <p>13 keep the 50/50 ratio?</p> <p>14 A Right. We'll get more calls than I can</p> <p>15 handle. And so, if we -- if there's an imbalance,</p> <p>16 we just don't -- let's say we've been -- got too</p> <p>17 many defense projects for that month, we'll just</p> <p>18 back off. And -- and before we finish the month</p> <p>19 out, we'll -- we'll balance it out.</p> <p>20 So we target a 50/50 on the intake side.</p> <p>21 Because I can't -- we don't do every project we get</p> <p>22 asked to do.</p> <p>23 Q Right. How many of the cases on this</p> <p>24 list were you retained by Ms. Cannella's firm or</p> <p>25 her former firm, Butler Wooten, just give -- if you</p>	<p style="text-align: right;">Page 49</p> <p>1 A Not off the top of my head, no.</p> <p>2 All right. I'm not sure who's got them.</p> <p>3 I think I can think of three.</p> <p>4 I think there is one other project. I</p> <p>5 don't know what it is, but I did hear a reference</p> <p>6 recently to a project. I didn't know the name of</p> <p>7 it. And I think Ms. Cannella was associated with</p> <p>8 it.</p> <p>9 Q When you say recently a part of it, do</p> <p>10 you mean that you're currently working on it or</p> <p>11 you're just aware that you might be working on it?</p> <p>12 Or what does that mean?</p> <p>13 A Well, I didn't recognize the style or the</p> <p>14 name and I asked someone who that was. And it was</p> <p>15 alluded to that was one of Ms. Cannella's projects.</p> <p>16 I think it's one we were working on.</p> <p>17 But I never -- I don't remember names</p> <p>18 very well. So I'm -- I'm answering your question.</p> <p>19 I think I would say three is the best answer.</p> <p>20 Q Three that you're currently working on?</p> <p>21 A Three I have.</p> <p>22 Q Three that you have. Okay, I understand.</p> <p>23 Sure.</p> <p>24 MR. HILL: All right. And if I didn't</p> <p>25 mention it, Ms. Court Reporter, that will be</p>

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<p style="text-align: right;">Page 50</p> <p>1 Exhibit 3, I believe, that we were just talking 2 about, his testimony list. 3 (Deposition Exhibit 4 marked.) 4 BY MR. HILL: 5 Q All right, now I've shared your fee 6 schedule. I'll make that Exhibit 4 just so we have 7 it. 8 And the only question I really have is 9 that is your current fee schedule and -- and 10 reflects the fees. 11 I know this may not reflect the fees that 12 you charged throughout the history of this case, 13 but it reflects the fees that you're currently 14 charging in association with your work in this 15 case; is that fair? 16 A Yes, sir. 17 Q All right. And that would include the 18 \$1,800 deposition retainer fee related to today's 19 deposition? 20 A Sure. 21 MR. HILL: All right. That's Exhibit 4. 22 (Deposition Exhibit 5 marked.) 23 BY MR. HILL: 24 Q All right. I've just shared what I 25 believed to be the invoices that you have invoiced</p>	<p style="text-align: right;">Page 52</p> <p>1 Q Well, on -- on December 21st, 2021, I 2 believe, someone from your office charging at a 3 rate of \$150 indicates a telephone conference with 4 a client. Is that what's kind of indicated on 5 this? See on December 21st? 6 A Yes. 7 Q I notice that you don't indicate the 8 actual name of the person working on it, there's 9 just the rate. 10 So do you recall who the project 11 engineers or the other individuals on this who 12 worked on -- on this action matter for you? 13 I know you can tell by the rate that 14 \$150 rate is going to be a project engineer, a 15 \$400 rate is going to be the chief engineer, which 16 I assume is you. Is all of that correct? 17 A Yes. 18 Q And then \$105 or \$100 might be a project 19 manager? 20 A A staff engineer-type person, yes. Could 21 be some project management there, too. But it's a 22 junior -- junior technical person. Could be a 23 project manager or it could be a staff engineer. 24 Q Right. And do you have a list anywhere 25 of the actual project managers, project engineers</p>
<p style="text-align: right;">Page 51</p> <p>1 from your work on this case. 2 We'll make that Exhibit -- whatever we're 3 on now, No. 4, I believe, or No. 5. 4 And I just have a few questions about 5 this. I don't know if you have it with you there. 6 It might be easier to look at. 7 But I'll take us to what I am now showing 8 as Invoice No. 26196. I believe that's the first 9 invoice chronologically that we have related to 10 your work in this case. And I just want to confirm 11 a few things. 12 It appears -- appears that the new file 13 intake or setup occurred on December 16th of 2021. 14 Is that fair to indicate that would be 15 your company's first involvement with this case? 16 A Yes. 17 Q All right. And do you normally on your 18 invoices indicate when you have communications with 19 the client, and the client being the lawyers that 20 have retained you? 21 A I would say no. If there's a formal 22 meeting set up or something, the office will 23 normally get it billed that way. But if I just 24 accept a phone call or -- then probably doesn't get 25 recorded that way.</p>	<p style="text-align: right;">Page 53</p> <p>1 and other individuals that worked on this case with 2 you? 3 A I don't. 4 Q Okay. And is there any way to determine 5 that, I mean, who was involved? It's -- it's not 6 indicated on the billing. I guess you'd have to 7 look back at each of these individual billing 8 records to determine which people were involved? 9 A Right. I don't know if that exists or 10 not. The work I'm -- that was initial setup work 11 which probably -- you know, it's -- a lot of that 12 is just busy work. 13 It's very vital to us, but it's pulling 14 the specifications, getting Google aerial set up, 15 you know, reading through the initial accident 16 report. 17 So it's -- it's -- I don't know who did 18 that at that point in time. I know who's done it 19 now, but not at that time. 20 Q Fair enough. 21 Well, just -- with regard to your 22 activities here in the month of December of 2021, 23 there's what appears to be two entries. Both are 24 for engineering analysis. One on the 17th and one 25 on the 21st. Is that --</p>

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<p style="text-align: right;">Page 54</p> <p>1 A Yes, sir.</p> <p>2 Q Is that correct?</p> <p>3 A Yeah, and that's -- and that was a good</p> <p>4 example because more than likely I was involved in</p> <p>5 the telephone conference, but it just says</p> <p>6 engineering analysis.</p> <p>7 So a junior engineer reviewed the</p> <p>8 materials, had a telephone conference with the</p> <p>9 client. I was also on that call looking at the</p> <p>10 bill, but it just didn't show up on -- on my entry,</p> <p>11 so.</p> <p>12 This -- that's -- just trying to clarify.</p> <p>13 Hope it helps.</p> <p>14 Q No, sure. That makes sense.</p> <p>15 You would have put down all of the time</p> <p>16 for your work on the case other than potentially,</p> <p>17 you know, communications with the client; is that</p> <p>18 right?</p> <p>19 A No. If I'm in the back working -- I say</p> <p>20 in the back, most of the engineering goes on in the</p> <p>21 back office, and I go up and I talk to somebody</p> <p>22 about a case, you know, if it's an informal</p> <p>23 meeting, we're going over what they're doing, you</p> <p>24 know, that doesn't get billed.</p> <p>25 If they come in here and schedule some</p>	<p style="text-align: right;">Page 56</p> <p>1 And it doesn't appear -- it appears at this point</p> <p>2 that you billed for one hour of work on 2/22?</p> <p>3 A Yes.</p> <p>4 Q All right. And you have virtual vehicle</p> <p>5 inspection listed as your work.</p> <p>6 Just what -- what does that mean exactly?</p> <p>7 What's a virtual vehicle inspection?</p> <p>8 A Sure. James Fries, with my office</p> <p>9 F-R-I-E-S, looked at both the vehicles, and he</p> <p>10 included me via a Zoom-type device so that I could</p> <p>11 -- he does the preliminary inspections. He</p> <p>12 contacts me. I look at what I want to look at, we</p> <p>13 talk about the work we're going to do, and then he</p> <p>14 proceeds to do it.</p> <p>15 So that's -- that's a convenient way to</p> <p>16 involve me without me having to travel all the way</p> <p>17 to Atlanta or wherever the vehicle happened to be</p> <p>18 at that moment.</p> <p>19 Q Great. That's what I thought.</p> <p>20 So he actually traveled -- and I can't</p> <p>21 tell which day exactly. I guess, the CDR download</p> <p>22 probably would have been loaded later, but sometime</p> <p>23 in February he actually performed a visual -- a</p> <p>24 physical -- blah -- a visual inspection of the</p> <p>25 vehicle and a CDR download; is that correct?</p>
<p style="text-align: right;">Page 55</p> <p>1 time it'll -- it'll get captured a lot better.</p> <p>2 But, you know, my aiding the staff, is</p> <p>3 part of my job as the chief engineer, so that</p> <p>4 doesn't always get billed.</p> <p>5 If it's something specific that directly</p> <p>6 requires me to sit down and -- and, you know,</p> <p>7 schedule some time to do it, it will tend -- tend</p> <p>8 to show up on the bill.</p> <p>9 Q All right. Well, is it fair to say that</p> <p>10 in December you -- you billed 2.5 hours for</p> <p>11 engineering analysis?</p> <p>12 A Yes.</p> <p>13 Q And you say there may be some additional</p> <p>14 time you worked on this case, but you're not sure?</p> <p>15 A Right. Normally it's going to be a</p> <p>16 little bit. But, you know, two and a half is what</p> <p>17 we billed and two and a half is a good number.</p> <p>18 Q Right. And then if we turn to the next</p> <p>19 page, this is for January of 2022, and it doesn't</p> <p>20 appear that you billed any time during that time</p> <p>21 period for work on this case, correct?</p> <p>22 A That is correct, yes.</p> <p>23 Q And if we go to the next invoice, this is</p> <p>24 for the time period -- there's one day in</p> <p>25 January -- but it's mostly for February of 2022.</p>	<p style="text-align: right;">Page 57</p> <p>1 A I think he did more than a visual, but</p> <p>2 yes, he did an inspection of both vehicles and a</p> <p>3 CDR download of the truck.</p> <p>4 Q Yeah. And when I say "visual," I just</p> <p>5 mean he was actually there?</p> <p>6 A Yes.</p> <p>7 Q Yeah. And then I know he did scans and</p> <p>8 other things. I -- I didn't mean to exclude that,</p> <p>9 but he was --</p> <p>10 A Okay.</p> <p>11 Q Yeah. And this is the first time someone</p> <p>12 from your office actually was physically present</p> <p>13 with the vehicles involved in the incident?</p> <p>14 A Yes.</p> <p>15 Q Okay. All right. Just quickly going to</p> <p>16 the next invoice which is No. 26627.</p> <p>17 There's a charge here for "Other: Lift</p> <p>18 Kit." Can you explain that? Were there multiple</p> <p>19 lift kits purchased from Rough Country or what's</p> <p>20 occurring there?</p> <p>21 A Right, we bought two lift kits. I think</p> <p>22 early on -- you know, so we bought a 4 1/2-inch and</p> <p>23 6-inch lift kit from Rough Country just as</p> <p>24 exemplars to have to look at.</p> <p>25 Q At this point had you determined whether</p>

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<p style="text-align: right;">Page 58</p> <p>1 a 4 1/2- or 6-inch lift was on the vehicle?</p> <p>2 A Not fully. We knew the front of the</p> <p>3 truck had gone up 6 inches, but I think we had</p> <p>4 indications it was a 4 1/2-inch lift, so we looked</p> <p>5 at both of those.</p> <p>6 I don't remember the exact process,</p> <p>7 thought process at that time, though, but there was</p> <p>8 -- there was always, you know, an observation that</p> <p>9 it was near a 6-inch lift.</p> <p>10 But also I believe we also had been told</p> <p>11 or had documentation it was a 4 -- 4 1/2-inch lift.</p> <p>12 Q And so during the vehicle inspection in</p> <p>13 February, Mr. Fries -- is that how you pronounce</p> <p>14 his name?</p> <p>15 A Fries (pronunciation), yes.</p> <p>16 Q Yeah. That he had -- he was not able to</p> <p>17 determine size of lift kit during that inspection?</p> <p>18 A Yeah, because of the confusion, yes.</p> <p>19 Q Right.</p> <p>20 A Quite possibly.</p> <p>21 Q And -- and what was the purpose of</p> <p>22 obtaining exemplar lift kits? What -- what did you</p> <p>23 intend to do with them?</p> <p>24 A Just more information. Clearly, I wanted</p> <p>25 to see what the individual components were. The</p>	<p style="text-align: right;">Page 60</p> <p>1 about what you ordered and when you ordered and all</p> <p>2 of that stuff, but if --</p> <p>3 A Sure. Thank you.</p> <p>4 Q So moving ahead to Invoice 27114-A. And</p> <p>5 there's a charge on September 29th of 2022 for</p> <p>6 "Base: vehicle scan processing."</p> <p>7 And then the next invoice has similar</p> <p>8 charges in October for "Base: scene drawing; Base:</p> <p>9 Vehicle drawing; Base: scene/vehicle drawing."</p> <p>10 Just kind of tell me what -- what do</p> <p>11 those represent and what's going on there.</p> <p>12 A Sure. Base refers to just objective data</p> <p>13 that's visible. The shape of the vehicle. The</p> <p>14 outline from the measurements. The shape of the</p> <p>15 scene.</p> <p>16 The officers did a great job of</p> <p>17 photographing and making photo mosaics. Well, we</p> <p>18 turned those into drawings, you know, so that we</p> <p>19 can make measurements on them.</p> <p>20 You know, it's just -- it's the</p> <p>21 background work to help with the later on detail</p> <p>22 reconstruction. This is foundational work that's</p> <p>23 going on that you're looking at here.</p> <p>24 The scans were taken. We have to process</p> <p>25 the scans, we can use it to make measurements and</p>
<p style="text-align: right;">Page 59</p> <p>1 Rough Country diagrams we had gotten from the</p> <p>2 internet or wherever, they showed the same pictures</p> <p>3 for the 4 1/2 kit and the 6-inch kit.</p> <p>4 In other words, you can't tell from the</p> <p>5 images that we were able to find the difference</p> <p>6 between them. So we said, well, let's just --</p> <p>7 let's order them and make sure we're, you know --</p> <p>8 we're not being fooled by a picture, which we were</p> <p>9 being fooled by a picture.</p> <p>10 Q When you say you're being fooled by a</p> <p>11 picture, what do you mean? You couldn't --</p> <p>12 A The images that we were able to find for</p> <p>13 a 4 1/2 and a 6-inch lift kit were the same image.</p> <p>14 So we -- we -- we -- we realized that</p> <p>15 that was not -- that the information we could get</p> <p>16 was not reliable. So we said, okay, let's just --</p> <p>17 let's order the kit.</p> <p>18 Q Are you relying upon your inspection of</p> <p>19 the exemplar lift kits to give your opinions in</p> <p>20 this case?</p> <p>21 A I would say no because we have</p> <p>22 documentation of it being a 4 1/2-inch lift kit</p> <p>23 now, so I would say no.</p> <p>24 Q Okay. I was hoping you would say that.</p> <p>25 I didn't want to waste your time asking questions</p>	<p style="text-align: right;">Page 61</p> <p>1 that type of stuff.</p> <p>2 Q That's what I thought. So these are</p> <p>3 processing the scans that Mr. Fries took back in --</p> <p>4 in February of that year?</p> <p>5 A Yes.</p> <p>6 Q All right. And scene drawing, have you</p> <p>7 guys -- no one had been to the scene in October of</p> <p>8 2022, correct?</p> <p>9 A That's correct.</p> <p>10 Q So when you say base scene drawing,</p> <p>11 what's that mean?</p> <p>12 And then he's using photographs that the</p> <p>13 police took that you referenced, but how are</p> <p>14 they -- they doing that?</p> <p>15 A The officers made a scale diagram. So we</p> <p>16 import their scale diagram. So we draw on top of</p> <p>17 them. We also use aerials.</p> <p>18 We're going to check their work, and</p> <p>19 that's what's going on here. And that can all be</p> <p>20 done, you know, in-house with information we have</p> <p>21 available over the -- you know, from Google and</p> <p>22 other aerial services we use and that type of</p> <p>23 stuff. So that's all that's going on here.</p> <p>24 Q Okay. Moving forward to Invoice 27394-A,</p> <p>25 there's a reference to exemplar car seats.</p>

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<p style="text-align: right;">Page 62</p> <p>1 Was there more than one exemplar seat 2 purchased? 3 A I only remember one. 4 Q All right. And do you remember the date 5 of manufacture of that exemplar seat? 6 A Excuse me. I coughed. 7 No, I don't remember the date of 8 manufacture. It was the same seat as far as we 9 could tell, though. 10 I don't remember everything that we went 11 through to tell that, but it was -- really it was 12 the shape. 13 We were going to test it for -- we were 14 going to use it as a mockup to look at the geometry 15 of the seat and they matched perfectly there. 16 Q And you -- you used it to place it in the 17 exemplar 2015 -- I'm sorry, the exemplar 2010 Ford 18 Escape that you used in the -- for the model? 19 A Yes. 20 Q All right. And do you have any 21 documentation anywhere in your file as to when that 22 was purchased, who it was purchased from, what year 23 it was manufactured, anything like that that would 24 validate that it was the same as the seat involved 25 in the subject crash?</p>	<p style="text-align: right;">Page 64</p> <p>1 All right. I've now put up there Invoice 2 29108-A from September 30th of 2023. 3 And there appears to be a bill here of 4 14.75, I guess that's hours, and that's at the rate 5 of 450. So I assume that's you on September 6th of 6 2023. 7 Would that reflect you actually making a 8 trip to see the accident vehicles in person? 9 A Yes. 10 Q And that's the first time you actually 11 saw them in person? 12 A Right, before I -- via video during the 13 inspections, but I actually was there in person for 14 the first time here. 15 Q Sure. And how much of this 14 -- does 16 the 14.75 include travel time as well? 17 A I -- I wouldn't think so, but I don't -- 18 I don't remember exactly. I was there -- in my 19 memory, I was there for seven or eight hours, so 20 it's probably just -- maybe just one-way travel. 21 We were there for a long time. 22 Q That's what I was getting at. So you'd 23 estimate you visually inspected the vehicles -- and 24 I know you might have done other things other than 25 just look at it, but you were there for seven to</p>
<p style="text-align: right;">Page 63</p> <p>1 A Well, I validated it looking at it 2 because that's -- that's what I wanted. 3 But we can -- I'm sure there's some 4 documentation. We have the seat itself somewhere 5 that we could provide. 6 So whatever someone needs, we could -- we 7 could go back and crowbar it out of a file 8 somewhere or maybe make the seat available. 9 Q Sure. Well, thanks. 10 I'm trying to get through this as fast as 11 I can and then we can take a break, if that's okay 12 with you. Don't want to leave it up to me to make 13 you not be able to have a break. 14 A Just for -- that was really hard to 15 understand. All you said was we'll take a break 16 when we need to, thank you, but... 17 Q Sorry for my poor audio. I apologize. I 18 was saying -- are you okay for us to just finish up 19 with these bills before we take a break? I didn't 20 mean to go on and on without giving you an 21 opportunity for a break. 22 A Thank you. I'm -- I'm waiting on you to 23 get to the end of bills. I think that's a great 24 idea. 25 Q Okay. Great.</p>	<p style="text-align: right;">Page 65</p> <p>1 eight hours on that day? 2 A That's an estimate. I don't -- I don't 3 remember exactly how many, but it was -- I was 4 there for, yeah, more than five I'm certain of. I 5 -- I don't know the exact time. 6 So looking at that it looked like -- 7 14.75 looks like too short a day to drive from here 8 to there and do that and get back, but... 9 And -- yeah, I had -- I had help with me, 10 too, that's not on the bill. I don't know why. 11 Q I would assume someone was there with 12 you, but that -- that person's time is not 13 reflected on this bill? 14 A Right. One of the project engineers or 15 the project engineer for this case went with me. 16 She had already seen the vehicle once before, so. 17 Q And what was her name? 18 A Melanie Porter, P-O-R-T-E-R. 19 Q Right. And I did not have anywhere here 20 where I saw that Melanie had visited the vehicles 21 in person prior to this, but -- but you're saying 22 she did and maybe just wasn't reflected on the 23 invoices? 24 A No, she did. She -- when the car seat 25 was put in the accident vehicle, she did that and</p>

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<p style="text-align: right;">Page 66</p> <p>1 scanned. So you alluded at it a few minutes ago. 2 That was -- Ms. Porter did that. So she had seen 3 the vehicles before. 4 Q All right. And I think if you look at 5 the next invoice which has got the same number, I 6 think it's the -- I should have shown you the first 7 page of it. 8 You'll see at the very bottom where it 9 appears that she billed the same amount of time for 10 "Document accident vehicles;travel" on 9/6. 11 A You're right. Thank you. 12 Q Yeah, I didn't -- 13 A I didn't want to leave anything out. 14 Q Yeah, I didn't realize this was the same. 15 Because this was basically the same invoice. I 16 apologize. 17 On this invoice here where there is a 18 reference to "Engineering analysis; review file and 19 reconstruction," there are quite a number of 20 entries that reflect that. 21 Is this reference to reconstruction -- 22 what is that referencing? 23 Is it referencing your reconstruction of 24 the actual accident or is it referencing the HVE 25 reconstruction or simulation?</p>	<p style="text-align: right;">Page 68</p> <p>1 billing is that the last one that I had on the 2 screen was the last one that we have in time. 3 A Okay. 4 Q And I was curious whether there's been 5 additional invoicing since then? 6 A No, there has not. 7 Q All right. And I put my -- let me take 8 it off of sharing. 9 You've obviously done work since the end 10 of September of 2023 on this case, correct? 11 A Yes. 12 Q And your report was in October of 2023. 13 Since the issuance of your report, have 14 you done any work on this case other than preparing 15 for today? 16 A Other than just trying to stay up to 17 speed, no. There's only been Bate stamping things 18 and, you know, I think the depo's been scheduled a 19 couple of times. I don't mean to infer anything. 20 It's just -- yeah, it's been -- but I -- 21 practically I don't know that any real work's 22 happened, but I could be wrong. 23 Q Well, that's what I'm getting on. There 24 -- you're not aware of any additional simulations, 25 any additional trips to the vehicles, trips to the</p>
<p style="text-align: right;">Page 67</p> <p>1 A It could be any of that. Depending on 2 how someone put it on their time sheet, we wouldn't 3 -- we wouldn't differentiate between those two 4 activities. 5 Q So there's no way to differentiate from 6 your invoices how much time was spent on the HVE 7 simulation? 8 A Right. The HVE is really a small part of 9 the total work. We -- we ran the calculations, but 10 it's -- it's in here somewhere. I don't know where 11 it is. But, yeah, it's -- it's just a tool. But 12 most of this would not be related to HVE. 13 Q Right. Do you know how much time was 14 spent on the HVE simulator? 15 A No, sir, not off the top of my head. 16 Q Do you know when it was performed? 17 A I -- I don't have a date memory. I -- 18 people have to still me it's 2024, so, no. 19 We've changed. Can I take a break? 20 Q Yeah, I was just looking at some real 21 quick. We can take a break. 22 A If we're not done with the bills, let's 23 go back and finish them. I -- I didn't mean to 24 interrupt you. I thought you were shifting gears. 25 Q Well, my only other real question about</p>	<p style="text-align: right;">Page 69</p> <p>1 scene, anything of that nature, that's occurred in 2 this case since the time of these bills? 3 A That's correct. 4 Q Okay. And one last thing on this bill. 5 There's a bill for "Scene visit; travel" on 6 July 14th of 2023. 7 I'm assuming that's the first time that 8 you visited the scene of the accident? 9 A Yes. 10 Q And it's the first time that anyone from 11 your office visited the scene of the accident? 12 A Yes. 13 Q And the purpose of that visit was to scan 14 the scene of the accident? 15 A No. The officers did -- we confirmed 16 through our drawings we thought that their drawings 17 were accurate, so our work -- I went to the scene 18 personally to look at it, make sure we weren't 19 missing some information that we needed. 20 I don't remember scanning it that day. I 21 don't think I needed to. So, I think I took 22 photographs and we're happy using the officer's 23 foundation of what they documented. They did a 24 fine job. 25 Q All right. In totaling these invoices, I</p>

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<p style="text-align: right;">Page 70</p> <p>1 have approximately \$65,000 in billings reflected on 2 this invoice. I wouldn't expect you to know off 3 the top of your head the total amount. 4 But does that sound like a fair 5 representation of your billing through the end of 6 September 2023? 7 A Oh, yes, sir. 8 Q All right. 9 MR. HILL: Why don't we take a break now. 10 I appreciate it. 11 THE WITNESS: All right. Thank you, 12 Rick. Back in a moment, Mr. Hill. 13 VIDEO TECHNICIAN: The time is 12:32. We 14 are off the record. 15 (Recess taken.) 16 VIDEO TECHNICIAN: The time is 12:48. We 17 are back on the record. 18 MR. HILL: Thank you. 19 BY MR. HILL: 20 Q One last question that kind of relates to 21 what we were just talking about. I thought I'd 22 start with that. 23 And that is, you indicated from the 24 billing records you can't tell when the simulation 25 was run using HVE, but you mentioned that after it</p>	<p style="text-align: right;">Page 72</p> <p>1 Q All right. But you -- but you believe 2 the simulation was run a day or two before that? 3 A Yes. I don't know if it was a day or two 4 or a week or two, but before that, yes, sir. 5 Q All right. So you believe the date on 6 this is just the day it was printed, not the date 7 it was run? 8 A We're -- we're swapping -- we're being 9 too fine here. It could have -- it was definitely 10 run before the report went out. What -- the 11 printing we have is on the -- the day after the 12 report went out. 13 Someone may have rerun it the day after 14 to generate the reports, but -- but all the 15 information I needed and wanted, I've been able to 16 look at before the report. I don't know whether it 17 was run and just wasn't printed or whether it was 18 rerun for the purpose of printing after the date. 19 Q I understand. 20 A Thanks. 21 Q So you would have referenced the digital 22 file in preparing the report and not necessarily 23 needed a printed version of it? 24 A No, I -- I like to work off of a printed 25 version. I -- I -- but I trust the staff to print</p>
<p style="text-align: right;">Page 71</p> <p>1 was run you would print out the reports it 2 generated and you have hard copies of those? 3 A That's my understanding, yes, sir. 4 Q All right. And when would those have 5 been printed out? Would it have been right after 6 the simulation was run? 7 A Yeah, it says 10/13 of '23. 8 Q Right. So that would be -- would that 9 indicate to you that that was the date that the 10 simulation was ran? 11 A That would be my starting preliminary 12 belief, yes, sir. 13 Q All right. Great. 14 All right. Let me see if I can share my 15 screen again. 16 A Okay. Let me update that. 17 Q All right. 18 A See, if I'm looking at 10/13 of '23, 19 that's a print date. The report says 10/12 of '23, 20 and we had referenced it. So apparently in 21 collecting our materials that went into the report 22 it was printed. 23 So it was run maybe a day or two before, 24 but the reports were printed the day after the 25 report just for filing. Thank you.</p>	<p style="text-align: right;">Page 73</p> <p>1 copies and put them in the file. I'm -- I'm 2 working on a printed version and I'll throw mine 3 away when I get done. They're supposed to give me 4 a copy and have a copy. 5 But it's kind of messy, too, because, you 6 know, we're -- we're really not worried about 7 printing at that point in time, we're worried about 8 engineering, which is, believe it or not, two 9 different worlds. 10 Q Sure. 11 MR. HILL: I'm sharing the screen. We 12 can mark this as whatever we're on now. I think 13 Exhibit 6 maybe? 14 THE COURT REPORTER: Correct. 15 (Deposition Exhibit 6 marked.) 16 BY MR. HILL: 17 Q And this is -- I'm sure you've got a copy 18 of this there in front of you, Mr. Buchner. You 19 probably -- it would be easier for you to refer to 20 your hard copy, but this is your October 12th, 2023 21 report we were just mentioning? 22 A Yes. 23 Q It is Bates labeled Bryson 1350 through 24 1361. 25 Have you amended or changed or done</p>

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<p style="text-align: right;">Page 74</p> <p>1 anything to this report since October 12th of 2023</p> <p>2 or is this still your current version of your</p> <p>3 report?</p> <p>4 A Still my current version. I only have</p> <p>5 one typo in the report. We said the airbags of the</p> <p>6 F250 deployed, they didn't. That was a -- that was</p> <p>7 a typo somewhere in the report. Other than that,</p> <p>8 no, sir.</p> <p>9 Q All right. So have you gone back and</p> <p>10 changed the report or is that -- you're just</p> <p>11 pointing out something you noticed in reviewing for</p> <p>12 the deposition?</p> <p>13 A Yes.</p> <p>14 Q Okay. And I'm assuming you have that in</p> <p>15 front of you so I don't have to have it up on the</p> <p>16 screen?</p> <p>17 A I do, but I'm -- I -- it's very easy for</p> <p>18 me to read it if you'll leave it up, but however</p> <p>19 you want to do it.</p> <p>20 Q Okay. Great. Well, let me -- hold on</p> <p>21 one second. Just -- this is related to it.</p> <p>22 All right. I've now put on the screen</p> <p>23 Bryson 1362 through 1374. And in your digital</p> <p>24 files this is entitled Support for your report.</p> <p>25 Is this something that is part of your</p>	<p style="text-align: right;">Page 76</p> <p>1 faster.</p> <p>2 A Okay.</p> <p>3 Q On -- on Page 1, you note that the posted</p> <p>4 speed limit was 55 miles per hour at this incident.</p> <p>5 Did you during your site visit to the</p> <p>6 scene confirm that when you were at the scene?</p> <p>7 A No, I can go back and look. But I'm</p> <p>8 aware that in one place the officers said 45, and</p> <p>9 in another place they said 55.</p> <p>10 I -- I didn't have a thought to go back</p> <p>11 and check my scene visit to see which one it was.</p> <p>12 It doesn't make a difference to my opinions.</p> <p>13 Q Sure. It makes no difference, we're just</p> <p>14 -- I just want to make sure we're on the same page</p> <p>15 with any typos and so forth.</p> <p>16 Like on the very next page, Page 2, under</p> <p>17 Work Performed, you said that your group inspected</p> <p>18 and documented the two vehicles between February</p> <p>19 2021 and September 2023?</p> <p>20 A Yes.</p> <p>21 Q Is that a typo there? Is that meant to</p> <p>22 be February 2022?</p> <p>23 A As a matter of fact, it is. Thank you.</p> <p>24 Q No problem.</p> <p>25 At one place in your material the -- if</p>
<p style="text-align: right;">Page 75</p> <p>1 report, is it just like an attachment to the</p> <p>2 report? Like how would you describe this document?</p> <p>3 A I -- I don't know. It's -- it's</p> <p>4 materials that I think help you interpret the</p> <p>5 report if you want to dig deep. They're reference</p> <p>6 materials.</p> <p>7 I don't remember whether it was formally</p> <p>8 attached or just sent as support information, you</p> <p>9 know, for the reader's benefit. I -- I don't</p> <p>10 remember. I don't know how to call it.</p> <p>11 MR. HILL: All right. We'll mark what I</p> <p>12 just mentioned, 1362 through 1374, as Exhibit 7 if</p> <p>13 I'm correct.</p> <p>14 (Deposition Exhibit 7 marked.)</p> <p>15 BY MR. HILL:</p> <p>16 Q And you're okay with the title "Support"?</p> <p>17 A Report support, sure.</p> <p>18 Q All right. Sure.</p> <p>19 All right. So here's the report. And if</p> <p>20 I don't have it on the right page, tell me at any</p> <p>21 time, but it's about time we got down to your</p> <p>22 report.</p> <p>23 So I appreciate you -- you having the</p> <p>24 patience going through all of that introductory</p> <p>25 stuff. Hopefully, that will make a lot of this go</p>	<p style="text-align: right;">Page 77</p> <p>1 you look down here where you're listing the</p> <p>2 exemplar vehicles, you have a 2008 Ford Escape</p> <p>3 exemplar vehicle.</p> <p>4 There was some notification in your</p> <p>5 records that the exemplar vehicle was actually a</p> <p>6 2010 Ford Escape.</p> <p>7 Do you know which one is accurate?</p> <p>8 A I'm thinking to see if I can give you a</p> <p>9 clear answer and I don't remember the date of that</p> <p>10 vehicle, so I'd have to do a little research.</p> <p>11 It's --</p> <p>12 Q Okay.</p> <p>13 A And it's specific to the exemplar.</p> <p>14 Q As we go through we may look at some</p> <p>15 documents that may clear that up. Just was curious</p> <p>16 if that was just another typo or if that's actually</p> <p>17 accurate.</p> <p>18 A Thank you. I'll -- I'll watch to help</p> <p>19 clear that up if we can.</p> <p>20 Q All right. Next we're on Page 3 under a</p> <p>21 section entitled Observations. The very last</p> <p>22 bullet point under Observations related to the</p> <p>23 Escape. You say: "The rear bumper of the Escape</p> <p>24 was only slightly bent."</p> <p>25 A Yes.</p>

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<p style="text-align: right;">Page 78</p> <p>1 Q What do you mean by "slightly bent"?</p> <p>2 A It was very unremarkable in the amount of</p> <p>3 damage to it. In other words, I've seen cars in</p> <p>4 minor collisions that had bumpers that were bent</p> <p>5 this badly and still on the vehicle, you know, and</p> <p>6 I'm talking about a vehicle, the vehicle drives off</p> <p>7 and, in fact, you have to look under the bumper</p> <p>8 cover to see this damage because the bumper cover</p> <p>9 goes in and bounces out.</p> <p>10 And so the photos show what it looked</p> <p>11 like, but it was very unremarkable in the amount of</p> <p>12 damage to it relative to the severity of the crash.</p> <p>13 Q Was the bumper of the Escape on the</p> <p>14 vehicle when you inspected it?</p> <p>15 A By that time it was off if my -- it was</p> <p>16 hang -- it was -- it had dropped off. Gone after</p> <p>17 the accident hanging by a thread more or less, but</p> <p>18 then by the time I saw it, it had come completely</p> <p>19 off.</p> <p>20 Q Sure. And did you look at the brackets</p> <p>21 that support the rear bumper?</p> <p>22 A Yeah, they were still on the bumper.</p> <p>23 They had torn away from the frame rails or the</p> <p>24 frame rails had torn away.</p> <p>25 So, yeah, they had for -- damage for the</p>	<p style="text-align: right;">Page 80</p> <p>1 Q All right. All right. The second to</p> <p>2 last bullet point under Observations on Page 3 you</p> <p>3 indicate that "The Escape's measured weight was</p> <p>4 3,410 pounds at the inspection on February 22nd,</p> <p>5 2022."</p> <p>6 A Yes.</p> <p>7 Q How did you measure the weight of the</p> <p>8 Escape on that day?</p> <p>9 A We have scales that we carry with us in</p> <p>10 our field work trucks. We drove it upon those</p> <p>11 scales and photographed and wrote down the</p> <p>12 measurements, the weights of the Ford --</p> <p>13 Q Right.</p> <p>14 A -- tires.</p> <p>15 Q Right. Like wheel scales, I guess, would</p> <p>16 be a common term for those?</p> <p>17 A Sure.</p> <p>18 Q Yeah. And -- and who manufactured those</p> <p>19 wheel scales, do you know?</p> <p>20 A I don't remember. We've had them for a</p> <p>21 long time. Same manufacturer we've been using for</p> <p>22 20 years.</p> <p>23 Q Do you know the capacity and readability</p> <p>24 of those scales?</p> <p>25 A Some of them have a 10, plus or minus 10,</p>
<p style="text-align: right;">Page 79</p> <p>1 bumper had allowed the bumper to come off, but the</p> <p>2 metal that it had been bolted to was still attached</p> <p>3 to the bumper. And the metal had been ripped and</p> <p>4 torn apart to allow it to dislodge.</p> <p>5 Q Gotcha. And the holes in the brackets,</p> <p>6 were they deformed or elongated? Would that be a</p> <p>7 proper way to describe it?</p> <p>8 A I don't remember that. I'd have to go</p> <p>9 back and look. I -- I remember more the more</p> <p>10 significant frame rails were basically -- we call</p> <p>11 them frame rails. That's what I like to call them,</p> <p>12 but the unibody rails, were -- were -- were torn.</p> <p>13 But we can look at the photos. I don't -- I don't</p> <p>14 remember the holes themselves being damaged.</p> <p>15 Q All right.</p> <p>16 A If I might interrupt.</p> <p>17 Q Sure.</p> <p>18 A The exemplar that we saw was manufactured</p> <p>19 of 2 of '10. So it actually could have been a --</p> <p>20 yeah, 2 of '10, so it was a -- probably a 2010</p> <p>21 vehicle.</p> <p>22 Q Right. And then we're talking about the</p> <p>23 Ford Escape exemplar that you used in your</p> <p>24 analysis?</p> <p>25 A Yes, sir.</p>	<p style="text-align: right;">Page 81</p> <p>1 some have a plus or minus 20, I think, but I'd have</p> <p>2 to go back and look on them.</p> <p>3 Q Not sure which -- which one you used in</p> <p>4 this case?</p> <p>5 A We have -- we have local ones we carry,</p> <p>6 yes. I don't remember off the top of my head.</p> <p>7 Q Okay. And they're scales you own? Like</p> <p>8 you own those, right?</p> <p>9 A Yes. Yeah, they're standard. We use</p> <p>10 them, you know, every week.</p> <p>11 Q All right. How often do you calibrate</p> <p>12 those?</p> <p>13 A Well, we -- we self-check them by putting</p> <p>14 our vehicles on them. So we -- we know when one's</p> <p>15 out of calibration. So we do a calibration check.</p> <p>16 Whenever we find an issue, we'll have</p> <p>17 them recalibrated by the manufacturer. So it's on</p> <p>18 an as-needed basis.</p> <p>19 Every now and then we'll periodically</p> <p>20 just send them off anyways. But I don't -- I don't</p> <p>21 remember the exact calibration schedule, but we are</p> <p>22 checking the calibration.</p> <p>23 I used to do calibrations at the other</p> <p>24 firm I used to work at. So as long I'm getting the</p> <p>25 right reading, I'm happy.</p>

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<p style="text-align: right;">Page 82</p> <p>1 Q Right. But you can't say here today when 2 the last time they were calibrated prior to your 3 using them on February 22nd of 2022? 4 A Right. I just know that we do the 5 calibration checks regularly so that we'll -- if 6 there's a problem, we take that one, that one scale 7 out of rotation and, you know, put another one in 8 the rotation while that one gets calibrated. 9 Q Right. Given the weight you measured 10 that day of the post incident version of the 11 Escape, do you have an opinion about the total 12 weight of the Escape at the time of the crash? 13 A Yes, I do. It's in my materials. But 14 basically we just add the weight of the occupants 15 to it. It still had the -- 16 Q Right. 17 A -- it still had the luggage in the back. 18 It wasn't luggage, but the cargo in the backseat 19 and the vacuum cleaner and a few other things. 20 Q Yeah, did you in estimating the weight at 21 the time of the crash account for the items in the 22 cargo hold? 23 A Yeah, they were in the car. 24 Q Right. But I'm saying -- they were in 25 the car at the time you weighed it?</p>	<p style="text-align: right;">Page 84</p> <p>1 that they were reasonably positioned as they were 2 at the time of the crash, but it would not change 3 any of my analysis if for some reason someone had 4 put the vacuum cleaner in the front seat. We'd 5 still have the right weight for the calculations. 6 But my belief is they were in their 7 proper locations. 8 Q And did you photograph the location of 9 those items when you inspected the vehicle in -- in 10 February of 2022? 11 A I would say yes, but I certainly don't -- 12 out of the thousands of photos we have, I don't 13 remember that particular photo. We can go look if 14 you want, but I would say that we're supposed to 15 document where everything is when we get there, so 16 I believe it's documented. 17 Q Sure. Kind of what I'm getting at is, 18 did you do any analysis of the -- and let me put it 19 this way -- of what may have impacted the child's 20 head who was in the -- the rear seat? What actual 21 physical item might have impacted his head? 22 A Well, I'm not the biomechanic. I did do 23 an analysis, though. I'm -- I'm certainly not 24 opining anything hit the child's head because 25 that's not my area of expertise, but I can tell you</p>
<p style="text-align: right;">Page 83</p> <p>1 A Yes. 2 Q Weighed the vehicle? 3 A Yeah. 4 Q Okay. Do you know at the time that you 5 weighed the car with the cargo in the cargo hold 6 whether those items were in the same position they 7 were in after the crash? 8 A Reasonably, yes. They were in the 9 backseat. I mean, they -- I say in the backseat. 10 They were in the -- behind the backseat in the 11 hatch area, in front of the hatch. 12 That's my recollection of -- that's where 13 they were when I saw them, and that's my 14 recollection of where they were when we weighed it. 15 Q Yeah. And what I'm trying to get it is, 16 did -- I don't know if someone took it, took that 17 cargo out and you put it back in to weigh the 18 vehicle or it hasn't been touched since the time of 19 the crash and so you got to see it sort of how it 20 would have looked at the scene. 21 You know, what is your understanding as 22 to the location of those items when you saw them in 23 relation to where they were located at the time of 24 the crash? That's just what I'm trying to get at. 25 A My understanding and my recollection is</p>	<p style="text-align: right;">Page 85</p> <p>1 that the rear seat was pushed to less than a foot 2 -- within a foot of the front seat. 3 In other words, the child's headrest area 4 of the car seat was pushed to less than a foot away 5 from the seat in front of it. 6 So that's information I have that might 7 be helpful, but I'm not here to talk about the 8 child's head hit or if it did hit anything. It 9 seemed logical it did, but I'm not -- that's not my 10 area of expertise. 11 Q I understand. And so you're not a 12 biomechanical expert who's providing -- going to 13 provide any testimony about injury mechanisms or 14 anything like that in this case? 15 A Right. But I will give the measurement 16 between the headrest and the seat and the back of 17 the seat in front of it was less than a foot 18 because that's -- that's part of my geometric 19 analysis that I've done of the crush of the 20 vehicles. 21 Q Right. All right. Turning to Page 4 22 here. Make sure I'm on the right page, if you give 23 me one second. 24 Here at the top of Page 4, you make a 25 couple of comments about the F250 tires.</p>

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<p style="text-align: right;">Page 86</p> <p>1 The first being that the F250 tires were 2 about half an inch larger radius than stock tires. 3 And you're commenting here on the actual vehicle 4 involved in the incident, correct? 5 A Yes. Which line are you looking at? 6 Q It's at the top of Page 4. 7 A Got it. 8 Q I don't know if you can see my cursor. 9 A Yes, that -- so that is the action -- 10 accident tires. Versus the stock tires. 11 Q All right. So in the previous slide you 12 mentioned that the ground clearance from original 13 to the ground clearance of the subject vehicle was 14 .75 inches. 15 A Yeah, I said about 10 inches because I'm 16 trying to measure it when I'm laying on the ground 17 underneath the truck. And so, I'm -- that's a 18 measurement that I'm trying to make on a damaged 19 truck. 20 The radius on the tires is just a -- it's 21 a published value or a -- for the tires. It's -- 22 given the size of the tires, that's what it's 23 supposed to be. 24 So a quarter inch variability there is 25 not an issue for me.</p>	<p style="text-align: right;">Page 88</p> <p>1 Q And the bumper was off as well. Did 2 you -- did you put that on the scale in any way or 3 was that another item that would have been -- 4 A No. 5 Q -- not included in your measurement? 6 A Well, it would have been just set on the 7 back of the vehicle for the weight. 8 Q Right, but the spare tire and rim, there 9 wasn't a way to set it on the back of the vehicle 10 as part of the measurement? 11 A Right. So it's either floating around 12 or -- I mean, it's even a chance it wasn't in 13 there. But it's -- it was in the backseat as best 14 as I can tell just sitting here. 15 So there's a little bit of variability 16 because, you know, it was knocked off. And so it 17 -- I'm just pointing that out because I thought it 18 was something I forgot to mention in the previous 19 answer. 20 Q Sure. Thanks. 21 Speaking of weight, the next question is 22 about the weight of the F250. Your bullet point's 23 saying it was 8,040 pounds. I'm assuming you 24 weighed it with the same scales? 25 A Yes.</p>
<p style="text-align: right;">Page 87</p> <p>1 Q Sure. I understand. I'm just trying to 2 get an explanation for why if it's only a half-inch 3 larger radius than stock tires, how is the ground 4 clearance .75? 5 A Yeah, and you've also got -- there can be 6 tread differences on the tires itself that -- 7 actually, you know, so the radiuses aren't perfect 8 calculations either. So, you know, all of that 9 being within quarter inches, fine with me. 10 Q Sure. Right here at the -- 11 A If I might interrupt again. 12 Q Sure. 13 A You asked about weight earlier. The 14 spare tire for the car got knocked off. So when we 15 weighed it, I don't think it was in the back. I 16 think it was in the back -- I think it was 17 somewhere else, so. Because it was hard -- really 18 hard to get in and out of the back. 19 So I'm just pointing that out. That 20 would be the -- the wild card in -- in weighing it, 21 but -- so the weights could shift around based on 22 where the spare tire was. 23 Q Sure. But you're going back to the 24 Escape when you -- the subject Escape? 25 A Yes, sir.</p>	<p style="text-align: right;">Page 89</p> <p>1 Q And was the cover over the -- the cargo 2 area of the pickup truck, was that on the F250 when 3 you weighed it? 4 A Well, however it shows up in our 5 inspection photos, I'll have to go back and look. 6 When you say cover, I -- 7 Q Yeah. 8 A Go ahead. 9 Q I'm always bad at this word, but, you 10 know, the tonneau cover, I don't know how -- 11 exactly how you actually pronounce that. 12 A Yeah, let me -- 13 Q That's the cover I'm talking about. 14 A I don't remember there being a tonneau 15 cover on it when we saw it. So might have to 16 investigate that. 17 I don't remember adding a weight to the 18 tonneau cover if it had a tonneau cover, but I'll 19 have to look to see if -- because that term has got 20 a lot of different term -- ways it can look. 21 So let me just look at a date of accident 22 photo real quick, please. 23 Q Sure. 24 A All my computers are apparently working 25 on video right now.</p>

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<p style="text-align: right;">Page 90</p> <p>1 Q We can come back to that. I was just 2 trying -- you were talking about things that may 3 not have been included in the measurement of the 4 weights of the vehicle, so I thought I would 5 mention it. 6 A Okay. 7 Q Again, you can figure it out when we take 8 a break. 9 A Sure. No problem. Thank you. 10 Q All right. Under the section entitled 11 "Based on the EDR of the -- of the F250," you say 12 the impact delta-V was 17.92 and the 13 longitudinal -- you know, longitudinal and .14 14 lateral. 15 Is there any difference between the term 16 impact delta-V and just delta-V? That's a term I 17 hadn't heard before. 18 A Just to clarify, delta-V is a generic 19 term. It can be applied generically where people 20 understand it, but impact delta-V to me is making 21 sure that we're understanding that during the 22 collision the actual delta-V is what we're using 23 here. 24 I don't think it -- 25 Q I understand.</p>	<p style="text-align: right;">Page 92</p> <p>1 as to why the airbag did not deploy on the F250? 2 A Probably because it hit the -- a very 3 soft area of the Escape. 4 In other words, the airbag deployment is 5 based on the -- the rate of deceleration largely of 6 the vehicle, and the deceleration is going to be 7 less when you run into something soft and mushy. 8 Q Did you, in looking at the download, note 9 that there was an airbag error code on the 10 download? Do you recall that? 11 A I don't remember that, no, sir. 12 Q There was a fault code of U3000-49 13 indicating an error in the electronic module. 14 Could that be an explanation for why the 15 airbag didn't deploy? 16 A I might have to go back and look at it. 17 It hasn't been a concern of mine. You asked a 18 question and I answered it. I'll do more 19 investigation -- 20 Q Sure. 21 A -- tonight if it's important. It hasn't 22 really been important to the work we've done. 23 And to go back one, thank you for always 24 letting me do that. 25 The tonneau cover was on it when we</p>
<p style="text-align: right;">Page 91</p> <p>1 A I don't think it makes any difference at 2 all, it's just the way we happen to write it, but 3 we're talking about the collision between the two 4 vehicles. 5 Q Right. Just wanted to make sure that was 6 the case in case there was some difference between 7 delta-V or im- -- and impact delta-V. 8 A Sure. 9 Q And you agree that the -- the delta-V 10 here listed should be in the negative? 11 A No, negative/positive. 12 Q Doesn't matter? 13 A Yeah, it's -- negatives and positives is 14 relative anyways. But if -- if someone wants to 15 say it's technically supposed to be negative with 16 some convention, I'm -- I'm fine with that. 17 We're -- we're just talking about the 18 overall magnitude. We understand that the truck 19 was slowing down. We're not trying to misrepresent 20 that. It's just the way we wrote it. 21 Q Sure. And this is where you talk about 22 airbag deployment. Is that where you said that was 23 a typo? 24 A Yes. 25 Q All right. And do you have any opinion</p>	<p style="text-align: right;">Page 93</p> <p>1 weighed it, it's just open. I -- because the job 2 box and everything was on it, I think, but it's -- 3 it was definitely on there when we weighed it. 4 Thank you. 5 Q Okay. Great. Thanks. I'm glad I 6 pronounced that word correctly. I was afraid you 7 were going to come out with a different 8 pronunciation and make me look foolish. 9 A Together we'll try to get these things 10 right. 11 Q Yeah. 12 All right. Just so we're clear on a 13 couple of things. How would you define "end of 14 event time"? 15 A Where is it written, please, sir? 16 Q Well, it's from 49 C.F.R. 563. Kind of 17 the terms that that code section uses. 18 A Well, I -- I can see -- in the C.F.R. it 19 may have its very specific definition. I wouldn't 20 want to disagree with that. 21 But end of event time I would normally 22 just use as when the event in the download or when 23 the event in the black box data ends. 24 It wouldn't have to be associated with a 25 specific event. It could just be when they ended</p>

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<p style="text-align: right;">Page 94</p> <p>1 reporting information.</p> <p>2 So it's kind of a gray term, that -- that</p> <p>3 depending on the context we're using it in, might</p> <p>4 have slightly different meanings.</p> <p>5 Q Sure. And same with regard to the term</p> <p>6 "time zero." Is that different?</p> <p>7 A Well, time zero, we use it all the time</p> <p>8 in many different situations. So it -- it -- it</p> <p>9 floats as well.</p> <p>10 Time zero is what we normally call</p> <p>11 impact, but I'm more than happy to define it</p> <p>12 another way for the purpose of a conversation.</p> <p>13 But time zero is normally the</p> <p>14 collision -- time of collision.</p> <p>15 Q Perfect. I just wondered if I used those</p> <p>16 terms later, I wanted to make sure we were on the</p> <p>17 same page.</p> <p>18 A Sure.</p> <p>19 Q All right. Be happy I skipped over two</p> <p>20 pages there.</p> <p>21 All right. This is Page 6 of your</p> <p>22 report, and I believe this is where you start to</p> <p>23 describe how you used exemplar vehicles that you</p> <p>24 scanned to match up and determine the crush damage,</p> <p>25 the static crush damage that occurred in the actual</p>	<p style="text-align: right;">Page 96</p> <p>1 of a 2015 Ford F250 to a 2016 Ford F250 in the</p> <p>2 stock configuration?</p> <p>3 A And there's not a difference at all --</p> <p>4 from a gross standpoint an individual vehicle can</p> <p>5 have different tires on it.</p> <p>6 You know, in this case that happened in</p> <p>7 this one, but it's not because this was a 2015 or</p> <p>8 2016, it's just -- this is the exact same truck.</p> <p>9 It's just whoever ordered the 20 -- the accident</p> <p>10 truck it came with a slightly different tire than</p> <p>11 the 2015 that we had available to us.</p> <p>12 So it is the same truck, there's no -- I</p> <p>13 mean, we're -- we're not talking about trim here,</p> <p>14 but we're talking about the body of the truck and</p> <p>15 the ride of truck and everything is -- is the same.</p> <p>16 Q Well, was there any difference in the</p> <p>17 stock tire size that came with the vehicle from the</p> <p>18 manufacturer between the 2015 and the 2016 F250?</p> <p>19 A Well, you can get 2015 -- so the answer</p> <p>20 is, yes, but not necessarily the way you described</p> <p>21 it.</p> <p>22 In this model -- in any -- in this model</p> <p>23 year's range, you can buy a truck with different</p> <p>24 size tires on it.</p> <p>25 It so happened that the 20 -- that the</p>
<p style="text-align: right;">Page 95</p> <p>1 accident.</p> <p>2 Is that a fair description of what is</p> <p>3 being discussed here just so I understand that</p> <p>4 we're on the same page?</p> <p>5 A That's part of it, sure, yes, sir.</p> <p>6 Q All right. And the exemplar F250 you</p> <p>7 used was a 2015?</p> <p>8 A Yes.</p> <p>9 Q And what do you mean by you verified it</p> <p>10 using the VIN number?</p> <p>11 A We just pull the specs on both vehicles,</p> <p>12 and you -- you use the VIN just to verify that it</p> <p>13 is the vehicle we think we're looking at.</p> <p>14 I mean, we can do it -- it's just the --</p> <p>15 the standard way of referencing a particular</p> <p>16 vehicle in the industry.</p> <p>17 Q Okay. So you just use the VIN number to</p> <p>18 make sure that the vehicle you were looking at was</p> <p>19 actually attached to that VIN number?</p> <p>20 A We use the VIN number to make sure it was</p> <p>21 the right year, make and model of the vehicle for</p> <p>22 the study along with we were looking at the vehicle</p> <p>23 just to --</p> <p>24 Q Gotcha.</p> <p>25 Did you make any comparison of the height</p>	<p style="text-align: right;">Page 97</p> <p>1 accident truck had tires that were .04 inches</p> <p>2 potentially or .04 feet taller than the -- than the</p> <p>3 2015 that we had. They're both acceptable.</p> <p>4 And you look at the door of each truck to</p> <p>5 see what it came with. And that can be a</p> <p>6 supply/demand problem.</p> <p>7 In other words, the -- the tires can</p> <p>8 change because of who the manufacturer is</p> <p>9 purchasing the tires from and, you know, there's</p> <p>10 all kind of economies that go into that.</p> <p>11 So, yeah, there -- there was a different</p> <p>12 -- not necessarily because it was a different year,</p> <p>13 it's just the two trucks had different tires on</p> <p>14 them.</p> <p>15 Q Yeah, and I -- I think you're comparing</p> <p>16 the subject truck to the exemplar you used. We</p> <p>17 know that there were aftermarket tires installed on</p> <p>18 the subject truck.</p> <p>19 But if you were to compare a stock, for</p> <p>20 lack of a better word, OEM version of a 2016 versus</p> <p>21 a 2015 truck, did you account for any difference in</p> <p>22 the recommended tire sizes for those two models,</p> <p>23 that's what I'm getting at?</p> <p>24 A Okay. Yes. And a better answer to your</p> <p>25 question, the accident truck came stock with tires</p>

25 (Pages 94 - 97)

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<p style="text-align: right;">Page 98</p> <p>1 that were slightly .04 inches taller than the 2015 2 stock truck. Then -- 3 Q Gotcha. 4 A -- the accident will -- will -- the stock 5 truck got lifted and also had some slightly larger 6 tires on it in essence. 7 Q Right. I just want to make sure we were 8 talking about stock 2016. I was confused there. 9 A Understood. No, it's -- thank you. 10 Q And just because I was kind of confused 11 there, you say .04 feet or point -- 12 A Yes. 13 Q Yeah, so that's about a half an inch, I 14 guess, or... 15 A Yeah, pretty close to it. Let me 16 multiply it out. 17 .48 inches. It's a half an inch, yes, 18 sir. 19 Q And when you used the scan for the 2015 20 and input it into the HVE, did you adjust it by 21 that half inch? 22 A Yes. We can change the tire size in HVE, 23 so we put the tires, the right tires on the vehicle 24 that were -- they call it a stock 2016 which is the 25 accident vehicle.</p>	<p style="text-align: right;">Page 100</p> <p>1 (Off the record.) 2 VIDEO TECHNICIAN: The time is -- the 3 time is 1:28. We are back on the record. 4 BY MR. HILL: 5 Q Okay. On Page 7, I was -- I was asking 6 about how the measurements were verified of the two 7 vehicles. And the way it reads is that the 8 difference in height was determined using the scan 9 of the exemplar and then the F2 -- the subject F250 10 and then using the measurements of the subject F250 11 compared against the exemplar F250. 12 And I'm -- I'm -- is it compared against 13 the measurements of the exemplar F250? It's -- 14 it's just not clear what's being compared here and 15 I just want to clear that up. 16 A Okay. There's two things going on. 17 First is, we scan both the accident and 18 the exemplar. And then from those scans, we can 19 make measurements. 20 So it's -- that's -- that's one of the 21 ways -- that's -- that's how the scans are used. 22 We have to, you know, level them up and account for 23 the tire size. 24 But then I also can go measure against 25 the accident F250 with tapes and rulers and do it</p>
<p style="text-align: right;">Page 99</p> <p>1 Q Gotcha. And just -- what's the mechanism 2 in HVE for varying the height of the vehicle like 3 that from the one that you scanned and input into 4 the model? 5 A Well, you go into its tire selection and 6 you choose a tire with the right diameter. 7 Q Okay. 8 A So we're -- we're looking for a 34 -- I 9 think it's a 34-inch diameter tire, but it's in my 10 material. So we just -- they have a -- you select 11 the tire with the right -- the right size. 12 Q I gotcha. So the -- the model that you 13 ran that you rely upon did make that slight 14 adjustment for the stock tires that would have come 15 on a 2016 F250? That's all I'm trying to confirm. 16 A Yes. Yes. 17 Q If you look on Page 7 -- 18 THE COURT REPORTER: Mr. Hill, we've lost 19 your audio. 20 THE WITNESS: Mr. Hill, we -- 21 VIDEO TECHNICIAN: Would you like to go 22 off the record, counsel? 23 MS. CANNELLA: Yes. 24 VIDEO TECHNICIAN: The time is 1:25. We 25 are off the record.</p>	<p style="text-align: right;">Page 101</p> <p>1 that way as well, the manual way. So we're doing 2 it both ways. 3 And then you get a -- I think if we go 4 through the file, you -- we may find that there's a 5 slightly different answer between them. 6 But there -- there -- it's always over 6 7 feet over -- not over 6 feet, over 6 inches of 8 elevation change. I think 6.1 in one place and I 9 forget what the other is. 10 So that quarter inch that I was telling 11 you about earlier, you know, you've got to get 12 slight variability. 13 So we're -- we're looking -- when we say 14 "measures," we're using what I physically measure, 15 what my technicians physically measured, and then 16 in the scans what we're measuring out of the scans 17 as well. Or off the CAD drawings once we put them 18 in -- in CAD. 19 Q All right. And they -- then the -- 20 you're not -- and this may sound like the dumbest 21 question ever but I want to make sure I understand 22 it. 23 You're not actually physically measuring 24 the 2015 exemplar, you're just using the specs and 25 the CAD drawing; is that right? Or are you</p>

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<p style="text-align: right;">Page 102</p> <p>1 actually going out and physically measuring that?</p> <p>2 A We're -- we're doing both. Because --</p> <p>3 no, we're going to -- we're going to approach it</p> <p>4 with just pure measurements.</p> <p>5 I'm going to go to the exemplar. I put a</p> <p>6 tape against it. I know what the accident</p> <p>7 measurements are. I'm like, okay, this looks like</p> <p>8 this many inches. And we have to account for tire</p> <p>9 size. So I -- I do it that way and we do it in the</p> <p>10 scans as well.</p> <p>11 And when we're looking for, you know,</p> <p>12 redundancy or -- or a confirmation in -- from the</p> <p>13 two methods.</p> <p>14 One's not any better than the others, we</p> <p>15 just happen to did it -- do it both ways.</p> <p>16 Q At the very bottom of Page 6, the last</p> <p>17 sentence you've got: "The movement of the headrest</p> <p>18 area and the bottom of the seat were compared in</p> <p>19 Figure 5."</p> <p>20 And just to be clear, you're saying that</p> <p>21 the movement of the headrest area of the child's</p> <p>22 seat in comparison to the bottom of what seat?</p> <p>23 The bottom -- like what's the -- not</p> <p>24 the -- not the car seat but the bottom of, what?</p> <p>25 A No, the -- of the car seat. The bottom</p>	<p style="text-align: right;">Page 104</p> <p>1 A All right. I actually asked that</p> <p>2 question this morning of myself because I knew you</p> <p>3 would ask it and I forgot to go get the answer.</p> <p>4 If we just look at the -- if you want me</p> <p>5 to measure it quickly, I'll do that, but I don't</p> <p>6 have it off the top of my head.</p> <p>7 But it's shown there. It's shown, you</p> <p>8 know, a foot or so to -- the truck's a foot or so</p> <p>9 to the driver side. But I don't have the exact</p> <p>10 measurement committed to memory.</p> <p>11 Q And you input that same offset into the</p> <p>12 HVE simulation?</p> <p>13 A Yes, yes.</p> <p>14 Q Okay. You did measure it some way,</p> <p>15 right?</p> <p>16 A Yeah, we did it. I just didn't</p> <p>17 memorialize it, but it's in the drawings and</p> <p>18 everywhere else. It's just not spit out as a</p> <p>19 number.</p> <p>20 Q Yeah, I just didn't see it as a number</p> <p>21 anywhere and just didn't know if I was just missing</p> <p>22 it.</p> <p>23 A You didn't miss it. I thought the same</p> <p>24 thing. It's -- it's fully contained in the</p> <p>25 drawings, but it's not memorialized as a number.</p>
<p style="text-align: right;">Page 103</p> <p>1 -- the top of the car seat moved farther forward</p> <p>2 than the bottom of the car seat.</p> <p>3 The car seat actually rotated where the</p> <p>4 head area -- what I'm going to call the headrest</p> <p>5 area because that's what we measured. The headrest</p> <p>6 area moved farther forward than the base of the</p> <p>7 seat, the base of the car seat.</p> <p>8 Q That's what I thought. I just wanted to</p> <p>9 clarify it.</p> <p>10 A Sure.</p> <p>11 Q Thank you.</p> <p>12 A You're no longer sharing. If you want to</p> <p>13 share, it'll -- I'll be quicker at understanding</p> <p>14 what you're reading.</p> <p>15 Q Thanks. I turned off the share when I</p> <p>16 was trying to fix the audio problem. Sorry, I</p> <p>17 didn't mean to do that.</p> <p>18 A Understood.</p> <p>19 Q All right. So Figure 7 here on Page 8 is</p> <p>20 showing the maximum engagement as you modeled in</p> <p>21 3D.</p> <p>22 And I guess the initial question would be</p> <p>23 was what was the lateral offset of the two vehicles</p> <p>24 as you measured based on the combo, you know,</p> <p>25 longitudinal center lines?</p>	<p style="text-align: right;">Page 105</p> <p>1 And I don't see the drawing I'm looking for, but</p> <p>2 I'll -- I'll look for it while we talk and I'll --</p> <p>3 I'll give you that number in a minute.</p> <p>4 Q In this paragraph a little further down</p> <p>5 on this page, Page 8, it starts with "A CAD</p> <p>6 comparison of the post-crash vehicle." You say</p> <p>7 revealed over a half foot of dynamic rebound</p> <p>8 occurred?</p> <p>9 MS. CANNELLA: What was that? What was</p> <p>10 that, Rick?</p> <p>11 MR. HILL: Yeah, I'm sorry. I'll lean in</p> <p>12 closer. I apologize about all of this speaker</p> <p>13 issues.</p> <p>14 BY MR. HILL:</p> <p>15 Q There's a Paragraph on Page 8 that</p> <p>16 begins: "A CAD comparison of the post-crash</p> <p>17 vehicles," that's what I'm asking about. And you</p> <p>18 say it revealed over a half foot of dynamic</p> <p>19 rebound.</p> <p>20 And I'm just curious as to how exactly</p> <p>21 did you determine that a half foot of dynamic</p> <p>22 rebound, was it just comparing the maximum</p> <p>23 engagement with what you measured as with the</p> <p>24 static engagement or how is that determined?</p> <p>25 A You are correct. The static bumper</p>

27 (Pages 102 - 105)

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<p style="text-align: right;">Page 106</p> <p>1 profiles and the profiles give one measurement, but 2 then we know that there were parts of the vehicles 3 that touched each other that would require 6 inches 4 of additional crush for those vehicles to touch. 5 So it's a dynam -- it's a static versus 6 what we've concluded would be the dynamic crush. 7 Q Yeah, so it's not a calculation, like a 8 formula, it's just comparing two measurements? And 9 that's -- 10 A Exactly. 11 Q Okay. That's what I was wondering. 12 And I guess you use specific math points 13 to make those comparisons? 14 A Yes, we did. 15 Q All right. And it's -- it's the match 16 points that are highlighted with the -- I don't 17 know, like the shiny tape or whatever it was you 18 guys used to put a match up to match points. 19 A Yes, it is. Yes, the -- so points that 20 we documented, marked with tape. And then in 21 the -- in the 3D world, put those points together 22 for the static and dynamic crush. 23 Q Okay. Real quick, under this section 24 with ACM Data Analysis. Talking about the imaging 25 of the ACM. That was done, I guess, by law</p>	<p style="text-align: right;">Page 108</p> <p>1 Q Did ACMs record nondeployment events as 2 well? 3 A Oh, yeah, sure, yes. 4 Q Okay. Now we're on Page 9. This is the 5 ACM data. Just a couple of minor points to make 6 sure I understand it. 7 Your sentence right below the figure 8 records those delta-Vs, and -- and that's simply -- 9 you presented those values because those are the 10 ones at the end of the recording? 11 A Yes, that's -- once we believe the 12 collision is over with, that's the delta-V, 13 effectively over with. 14 Q All right. Then there's a discussion in 15 the next paragraph about the speed indication from 16 how -- how the speed vehicle is indicated in the 17 ACM. 18 And I guess I'd question, do you know 19 whether the missed -- the 2016 F250 used wheel 20 speed or transmission speed? 21 I mean, you seem to reference wheel speed 22 here, but does it also have transmission speed? 23 A When we say "wheel speed," we're talking 24 about how fast the truck thinks the wheels are 25 turning.</p>
<p style="text-align: right;">Page 107</p> <p>1 enforcement on that date? That was before you were 2 involved in the case? 3 A Yes. 4 Q And how did -- and this Crash Data 5 Retrieval Tool 19.3, you just know that from the 6 ADR readout, that's not referencing what you used; 7 is that right? 8 A It was in their materials, in the 9 officers' materials. They reported that. It may 10 be in the actual printout itself. 11 Q Gotcha. 12 Explain for me how the ACM recorded a 13 deployment of that when the airbags didn't actually 14 deploy. 15 A Yeah, that's the actual typo or maybe 16 there's another one. But the ACM recorded one 17 event. I don't remember it being a -- it was an -- 18 the airbags did not deploy, so that's -- that's 19 where I'm seeing a -- a problem. I haven't fully 20 researched it, but it was a nondeployment event. 21 And remember you asked me earlier about 22 an error code or something like that. I -- I want 23 to go back and look at all that, but it was a 24 nondeployment in actuality. So I think that's a 25 typo.</p>	<p style="text-align: right;">Page 109</p> <p>1 So it's going to think they're turning a 2 little -- it's going to think they're -- he's -- he 3 knows how fast they're turning, but then it's going 4 to convert that to a speedometer speed. 5 And so, that's all we're talking about 6 here. When we say wheel speed, it's -- it's 7 calibrated to calculate the wheel speed, so we're 8 just talking about the final answer here. 9 What -- how that -- you know, it probably 10 is mentioned in the transmission, but it can also 11 be checked with the ABS sensors and things like 12 that. 13 So I'm not getting into how this exact 14 truck does it, but it is looking for wheel speed. 15 I'll use more of a generic term. 16 Q Yeah, yeah, there's also a three-channel, 17 you know, speed-sensing system related to the 18 transmission, and that's just another source of 19 speed. 20 A Well, right, but it's calculating wheel 21 speed out of that. That's what it -- 22 Q Right. 23 A Yeah. 24 Q There's a discussion about Momentum 25 Calculations. I have a few questions about that.</p>

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<p style="text-align: right;">Page 110</p> <p>1 All right. When we're -- under this</p> <p>2 section, you're -- you're solely talking about the</p> <p>3 actual vehicles involved in this accident.</p> <p>4 This has nothing to do with the exemplar</p> <p>5 models that you used, correct?</p> <p>6 A Yes, sir.</p> <p>7 Q All right. I just want to make sure.</p> <p>8 And the vehicle weight you used in these</p> <p>9 momentum calculations were the ones you actually</p> <p>10 measured on the subject vehicle?</p> <p>11 A We measured them and then added the</p> <p>12 occupant weights on them. We have a whole sheet in</p> <p>13 our file about that.</p> <p>14 Q Right.</p> <p>15 A Yeah. It's the weighed measurement is</p> <p>16 the foundation.</p> <p>17 Q And what was the coefficient of</p> <p>18 restitution that you used in these calculations?</p> <p>19 A Well, you don't -- in momentum, you don't</p> <p>20 use a coefficient of restitution when you have this</p> <p>21 type of information. It's -- it's -- it's</p> <p>22 accounted for just in the delta-V.</p> <p>23 Q That's because you have the pre-impact</p> <p>24 and post-impact speeds in a delta-V?</p> <p>25 A Yes.</p>	<p style="text-align: right;">Page 112</p> <p>1 coefficient of restitution in this to get</p> <p>2 everything to balance out.</p> <p>3 So we -- we didn't have to, I don't</p> <p>4 think, but we did do it. We got -- so I misspoke a</p> <p>5 minute ago.</p> <p>6 It would be -- it would be helpful if I</p> <p>7 looked at the calculation before I answered the</p> <p>8 question.</p> <p>9 Q Is this it?</p> <p>10 A Yes, sir.</p> <p>11 Q All right. That's why I was asking you</p> <p>12 about it.</p> <p>13 A Yeah.</p> <p>14 Q This is Bryson 4000. And I guess since</p> <p>15 you -- you know -- tell us what -- what you're</p> <p>16 doing here with -- with both vehicles here just so</p> <p>17 I understand it.</p> <p>18 You've calculated a restitution of 0.148;</p> <p>19 is that correct?</p> <p>20 A It's actually being used to solve there.</p> <p>21 So I think I'd have to go back and -- go back</p> <p>22 through the calculation carefully, but the way it's</p> <p>23 being put in there, that's the effective</p> <p>24 restitution this shows, yes.</p> <p>25 And let me -- yeah.</p>
<p style="text-align: right;">Page 111</p> <p>1 Q Right.</p> <p>2 A You -- you could calculate it from this</p> <p>3 if you -- potentially but, you know, it -- you</p> <p>4 don't need it.</p> <p>5 Q All right. And you -- you basically</p> <p>6 accounted for a zero pre-impact speed for the</p> <p>7 Escape --</p> <p>8 A Yes.</p> <p>9 Q -- in the calculations?</p> <p>10 A Yes.</p> <p>11 Q And then your post-impact speed for the</p> <p>12 Escape was what?</p> <p>13 A 40.6 miles an hour in my calculation.</p> <p>14 Q Okay. And so the delta-V for the Escape</p> <p>15 will be approximately the same; is that right, or</p> <p>16 no?</p> <p>17 A What was the question?</p> <p>18 Q Yeah. So what was the delta-V of the</p> <p>19 Escape?</p> <p>20 A 40.6.</p> <p>21 And I misspoke a minute ago. If we input</p> <p>22 the 0 miles per hour -- well, anyway, we did it --</p> <p>23 we did set up a series of equations that used the</p> <p>24 -- that saw for the restitution. I said we didn't</p> <p>25 do that, but we did actually -- we did use the</p>	<p style="text-align: right;">Page 113</p> <p>1 Q I'm making sure you didn't need to see</p> <p>2 any other part of this file to answer that</p> <p>3 question.</p> <p>4 A Pardon me?</p> <p>5 Q I was just wanting to show you the rest</p> <p>6 of this file in case --</p> <p>7 A Well -- yeah, let me do -- I'm trying --</p> <p>8 unfortunately, you're looking at one thing and I'm</p> <p>9 trying to look at something else so that I can get</p> <p>10 on the same page and sometimes it's a little bit</p> <p>11 slow with it. Let me do something here.</p> <p>12 MR. HILL: Why don't we just take another</p> <p>13 quick five-minute break while you look at that</p> <p>14 because I kind of maybe need to use the restroom.</p> <p>15 I apologize.</p> <p>16 THE WITNESS: Sure.</p> <p>17 MR. HILL: If that works.</p> <p>18 THE WITNESS: That's fine with me.</p> <p>19 A Basically, we set it up --</p> <p>20 VIDEO TECHNICIAN: The time is --</p> <p>21 A -- with a series of equations to get</p> <p>22 everything to balance out using restitution.</p> <p>23 And we got the 51 and the 17.92 to match</p> <p>24 along with the weights. So we believe that this is</p> <p>25 a good momentum model.</p>

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<p style="text-align: right;">Page 114</p> <p>1 I had forgotten, but we did include 2 restitution. And so, all of our -- all of our 3 inputs balance with what we believed we know about 4 the accident using that .148. 5 BY MR. HILL: 6 Q Right. And correct me if I'm wrong, but 7 when you did the HVE simulation, wouldn't there be 8 a place to input this same coefficient of 9 restitution? 10 A Well, there's two different 11 methodologies, but, yes, you could input that but 12 it's -- it's really a -- kind of like earlier when 13 we were measuring how high the truck moved and I 14 said a quarter inch doesn't matter because you're 15 really using two different methods. It -- it 16 may -- it doesn't matter to me. 17 But you're just using a different method 18 here, another calculation method, which is -- is 19 robust. 20 So I don't want to mix my methods or 21 overvalue one above the other. I want to do them 22 independently and see what all the answers are. 23 So, but yes, someone could put that in 24 but in HVE it wouldn't quite balance because HVE is 25 looking at crush. This is not looking at crush.</p>	<p style="text-align: right;">Page 116</p> <p>1 THE WITNESS: Thank you. 2 VIDEO TECHNICIAN: The time is 1:49. We 3 are off the record. 4 (Recess taken.) 5 VIDEO TECHNICIAN: The time is 1:58. We 6 are back on the record. 7 BY MR. HILL: 8 Q All right. I've got the -- your report 9 back up. I hope you can see it. I'm on Page 10 10 where it is entitled Crush Analysis, that section. 11 A Yes. 12 Q And just to make sure it's clear, this 13 section refers to your use of mathematical 14 calculations to estimate the amount of crush in the 15 hypothetical incident of a stock F250 being 16 involved in this accident; is that a fair way to 17 say it? 18 A Yes. 19 Q And -- and this is not really connected 20 to the simulation section below dealing with the 21 HVE simulator? 22 They're two separate ways or tools that 23 you use to try to analyze the amount of crush and 24 the hypothetical of a nonlifted stock 2016 F250; is 25 that fair?</p>
<p style="text-align: right;">Page 115</p> <p>1 But the answers are probably the same 2 answers, 40-miles-an-hour delta-V. 3 Q Right. And HVE has to use a coefficient 4 of restitution in determining its crush analysis, 5 correct? 6 A Well, yes. 7 Q Right. And you mentioned that the 8 default coefficient of restitution that was used 9 when you first ran the simulation did not create 10 the results that you expected and you had to change 11 or manipulate that coefficient of restitution to 12 make HVE create the results that you expected; is 13 that fair? 14 A To create the results that were measured 15 by the truck, yes. 16 In other words, HVE has never seen this 17 crash, it's just a calculation. It's -- this is 18 just a calculation. 19 Calculations are nothing but simulations 20 of reality. We never expect a calculation to know 21 what really happened in the crash, it's just a tool 22 that we use as engineers to understand it. 23 Q Gotcha. 24 MR. HILL: Let's take that break real 25 quick. Just a short one.</p>	<p style="text-align: right;">Page 117</p> <p>1 A Right. 2 Q Okay. 3 A The pre-lifted vehicle. If the 4 pre-lifted F250 had been in the crash, that's what 5 we mean. 6 (Deposition Exhibit 8 marked.) 7 BY MR. HILL: 8 Q All right. And if I pull up here -- let 9 me find it. This is what is listed in your 10 materials as Crush Analysis, Bates labeled 3990 11 through 39 -- 999. 12 A Yes. 13 Q Is this -- am I right to refer to this 14 when I'm talking about the crush analysis you 15 mentioned on Page 10? 16 A Yes. 17 Q All right. And it starts here with a 18 depiction and it has the Accident Damage in red and 19 the Calculated Damage in blue. 20 And what that means calculated damage in 21 blue is what you believe the crush would have been 22 in the quote/unquote stock configuration of the 23 F250. 24 A That's what this method calculates, yes. 25 Q All right. And so it's approximately</p>

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<p style="text-align: right;">Page 118</p> <p>1 2.3 feet. You're saying -- what is that -- that's 2 the delta, meaning, the difference between the 3 maximum or the crush with the -- with the accident 4 itself and crush with the stock vehicle? 5 A Yes, that's how much less crush this 6 method predicts. 7 Q And are both of these lines following -- 8 well, obviously, the blue line is using the 9 calculated method. The red line, is that from 10 actual measurements or is that also using the same 11 method of calculations? 12 A No, that's -- that's where the crush was 13 on the car, on the Escape in the accident. 14 So the red line is what did happen, the 15 blue line is what in my opinion using this 16 methodology would have happened had the vehicle not 17 been lifted. 18 Q Right. And if we go down to this next 19 page, 3991, is the same type of -- I don't know the 20 right word -- showing the same type of -- of change 21 in crush between the accident damage and -- and 22 this methodology of calculating crush that's on the 23 pages we're about to get to, right? 24 The same thing, this is with a Ford F250? 25 A Okay, this is -- yes, in the calculation</p>	<p style="text-align: right;">Page 120</p> <p>1 the accident. 2 So it's not representative of what we did 3 in EDSMAC or the engine dynamics or in the other 4 calculation because this is -- this is, you know, a 5 -- the accident condition which is not what we're 6 trying to model in the other calculations. We're 7 trying to model a bumper-to-bumper-type hit. 8 Q So you used an estimate of the difference 9 in the coefficient of restitution if only the 10 bumper was impacted of .1? And that was just 11 your -- 12 A That's correct. 13 Q -- kind of reasonable value? 14 A Yeah, not only the bumper because other 15 things will hit, but yeah, the .1 is what I -- what 16 I used for the stock truck hitting a stock Escape. 17 Q And in your calculations here under the 18 stock you're assuming that there will be no bumper 19 override in this hypothetical impact? 20 A I'm not assuming it, I'm -- I'm 21 concluding it as an engineer based on what I know 22 about the accident. But, yeah, I don't believe 23 there is going to be any. 24 Q And you're concluding it based upon what, 25 just the heights of the two bumpers, based upon the</p>
<p style="text-align: right;">Page 119</p> <p>1 methodology we were talking about the Ford F250 2 would have had slightly more crush, and this is 3 what it would have been. 4 Q Right. And -- and 3992 is the 5 beginning -- 3993 illustrates how you use this 6 method to mathematically come to these conclusions? 7 A Yes. 8 Q That's correct, okay. 9 And we have a restitution on 3993 of 0.1. 10 Is that something that was calculated 11 based on these -- these calculations or was that 12 just input as part of the calculations? 13 A That's input as part of the calculations. 14 So that was input. 15 Q So what is the source of that number? 16 Why did you input .1 as the coefficient of 17 restitution? 18 A Thought it was a reasonable value. 19 Q Right. And it's -- it's different from 20 the value calculated with your momentum 21 calculations of .148? 22 A Yeah, but remember the momentum was -- at 23 that point -- I -- I didn't point this out earlier. 24 The .148 is for the accident when the hatch was hit 25 and we're trying to balance out what did happen in</p>	<p style="text-align: right;">Page 121</p> <p>1 measurements that you used from the exemplar, and 2 so forth? 3 A I'm using it -- I'm using my study of 4 this crash in my experience and training. And part 5 of that is the height, yes, sir. 6 Q What other factors led you to conclude 7 that there would be no bumper override other than 8 just purely the measurement of the heights in that 9 hypothetical situation? 10 A Well, we know -- okay, probably the -- a 11 factor that may not have been apparent yet but it 12 is if you look at the drawings and things. 13 The tow hooks of the accident truck went 14 into the hatch of the Escape, whereas, if the truck 15 had not been lifted, then the tow hooks would have 16 actually gone into the rear bumper fascia area and 17 actually under the -- the bumper bar itself. 18 So once this vehicle engaged, it would 19 have been impossible for it to go up and over 20 because you would have had a mechanical 21 interlocking to hold -- to prevent it from getting 22 up into the hatch. 23 It's kind of like a stop, if you will. 24 I'm a -- I'm a -- I'm an engineer. It's -- you 25 know, if -- if there's something that's underneath</p>

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<p style="text-align: right;">Page 122</p> <p>1 the bumper and penetrated underneath it, it can't 2 come back out and go around the bumper to get up 3 into the tailgate. 4 So, you know, there is some more 5 understanding coming in from it, but the other 6 thing is there's no forces going up or down in the 7 crash so that, you know, with good bumper-to-bumper 8 contact they're going to -- they're going to want 9 to stay married up with the original contact 10 elevation. 11 Whereas, in the accident, you know, the 12 -- the Ford F250 bumper actually hit the very top 13 of the Escape bumper and -- and helped push the 14 bumper down, bend it down and get the truck up into 15 the hatch. 16 So those would be the three -- that would 17 be the main things that I would point to and I 18 think that's all need to make that observation. 19 Q Sure. If the -- what about if there were 20 no tow hooks, is that the factor that you're 21 relying upon the most to say that there would be no 22 override? 23 A No. No, I'm looking at this particular 24 accident. I'm pointing that out as a -- I mean, to 25 me it's kind of like a giant billboard flashing in</p>	<p style="text-align: right;">Page 124</p> <p>1 able to rise up and get to the tailgate. 2 That's just in the extreme if someone 3 thinks, you know, that a normal bumper to bumper it 4 wouldn't have worked out. 5 Q But -- but you are saying that the tow 6 hooks would have been the bumper bar in a way that 7 would have prevented it from overriding the bumper 8 bar? 9 It would have been below the level of the 10 bumper bar and gone underneath, is that my 11 understanding of the record? 12 A Yeah, it would basically serve to keep 13 the bumpers -- help serve to keep the bumpers 14 engaged if for some strange reason they didn't want 15 to which I don't have any evidence of. 16 Q Gotcha. 17 Would it -- is it your opinion that it 18 would have been impossible for the stock version 19 with the tow hooks to have overridden the bumper? 20 A Reasonably, yes. 21 Q What do you mean, what's the 22 qualification of reasonably? 23 A Well, you can tell me all the conditions 24 that were going on and everything, so. 25 So, but, you know, if you just -- if you</p>
<p style="text-align: right;">Page 123</p> <p>1 the sky. 2 But, you know, it's -- it's -- it's 3 obvious it wouldn't have gone over. But even if it 4 had been -- even without the tow hooks because of 5 what I was talking about earlier you would have 6 flush impact, there's no forces pushing them up or 7 down. 8 Remarkably you're in the collision phase 9 to -- to upset that engagement if the -- if the 10 truck had been a stock truck. 11 Q Gotcha. I just want to make sure I 12 understand it. 13 So, in your opinion, that the tow hooks 14 would have played a role in this and would have 15 gone underneath the bumper of the Escape, that's 16 based upon just the pure height of the tow hooks in 17 your belief as to where they would have impacted 18 the bumper of the Escape? 19 A It is not underneath the bumper, 20 depending on what we call bumper, but they would -- 21 they would slide underneath the bumper bar that's 22 inside what's normally called the bumper area. 23 In other words, it would have -- instead 24 of poking into the tailgate, it would have poked in 25 -- it would have prevented the truck from being</p>	<p style="text-align: right;">Page 125</p> <p>1 just run that F250, a stock F250 in the back of an 2 Escape, you're not going to override it, no. 3 But I don't -- you're creating a new 4 accident -- I say you're creating a new accident. 5 I'm not sure how big your question was, but if they 6 just hit like they did in this accident, I would 7 say reasonably it's not -- not possible. 8 Q And when you say "this accident," you 9 mean the subject accident we know they were higher 10 and there was override. 11 I'm talking about this hypothetical that 12 you're analyzing of this crush analysis of a 13 stock version. 14 A Right. Where you change this accident 15 where a stock truck hits this vehicle the way the 16 subject truck did, it's just not lifted. No, 17 there's no reasonable possibility that they're 18 going to get an override situation out of it. 19 Q Whether there's tow hooks on there or 20 not? 21 A Right, with or without, but the tow hooks 22 are going to, you know, just be icing on the cake, 23 if you will. 24 Q I understand. 25 A Yes.</p>

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<p style="text-align: right;">Page 126</p> <p>1 Q But your opinion with or without the tow 2 hooks, stock configuration, there's no chance of 3 override? 4 A Right, no reason to chance at all. But, 5 you know, if I'm showing this to the jury, I'm 6 going to show them that the tow hooks are going to 7 hit underneath that bumper bar and it's going to 8 lock that truck in so that they can have the same 9 billboard in the sky that I have. 10 I mean, it's got -- if you've got 11 something indexing and holding them at that 12 elevation, it's -- it can override it. 13 So to me that's an -- that's an important 14 argument but it doesn't -- doesn't mean that the 15 vehicles won't do it if they just hit bumper to 16 bumper. It's just easier to understand. 17 Q You're just saying that's one element of 18 your argument that a stock configuration can't 19 override, and that's the tow hooks would play a 20 role, that's all you're saying? 21 A Very easy to understand. 22 Q Sure. All right. This page here, 3994 23 from AutoStats, followed this factor into your 24 crush analysis using the mathematical point. 25 A The crush -- when -- when we're reporting</p>	<p style="text-align: right;">Page 128</p> <p>1 A Both. The -- 57 percent of the curb 2 weight will be on the front axle and 43 percent 3 will be on the rear axle. 4 Q And did you use that same distribution 5 when using the HVE simulation? 6 A Yes. 7 Q All right. And then for the -- this is 8 just -- this page just has the information on the 9 Escape. Did you use this same type of information 10 for the F250? 11 A Yes. 12 Q All right. That's -- I don't see that 13 included with your crush analysis. So is there a 14 page missing from this or -- 15 A No, the -- the specs are in the file. 16 For some -- when we're doing the crush analysis, we 17 want to remind ourselves about the difference in 18 5 inches. That's what's highlighted here. 19 That wasn't important for the truck 20 because it used its bumper on everybody. 21 The weight percentages are in another 22 part of the file, they just happen to also be on 23 this page. 24 Q Okay. And tell me again the significance 25 of reminding yourself of the 5 inches.</p>
<p style="text-align: right;">Page 127</p> <p>1 crush on the Escape sometimes we're just recording 2 from the back hatch because that's what crushed in 3 and -- and stopped the truck. The bumper and 4 everything went down and got bent up. 5 So this is just reminding us that it's 6 about 5 inches from the back hatch to the bumper 7 itself. 8 Q And when you say 5 inches, explain that. 9 When you say -- you mean the bumper protrudes 10 beyond the hatch about 5 inches? 11 A Yes. 12 Q Okay. And this is -- again, you used the 13 2010 information from AutoStat? 14 A It's the same as -- it's the same as '08, 15 yes. It's -- yeah, it's -- all this data is for 16 that year range of vehicle. 17 I just happened -- or I didn't -- the 18 staff engineer that did this happened to print the 19 2010, but it's the same information as the 2008. 20 Q And it has a weight distribution for the 21 Escape of 57 percent on the front and 43 percent on 22 the back; is that correct? 23 A Yes. 24 Q That relates to the overall weight or is 25 that the curb weight on the axis?</p>	<p style="text-align: right;">Page 129</p> <p>1 A In the drawings -- and we're not looking 2 at a specific drawing here, but there's 5 inches 3 between where the bumper is and where the hatch is 4 on the Escape. 5 So because the hatch is the one that 6 crushed forward when we're -- sometimes when we're 7 measuring crush, we're measuring displacement of 8 the hatch. 9 And we want to remind ourselves that when 10 we're reporting total crush, we need to add 11 5 inches to that to measure from the bumper which 12 is more typical. 13 So it's just -- it's part of a 14 conversation when we're talking about crush. It's 15 not right, it's not wrong, it's just a number. And 16 we want to remember what the number is. 17 Q Yeah. 18 A So like right here see the 3.35 inches on 19 Page 003995 Bate stamped. That 3.35 is measured to 20 the hatch. So we need to add 0.4 feet to it to 21 express the total crush. 22 Q Talking about crush in relation to the 23 end of the bar? 24 A Right, which is where it's normally 25 expressed from.</p>

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<p>1 Q Right. This document labeled 3997, just 2 explain this for me. This is from Neptune 3 Engineering. This is an outside source that you 4 use to, I guess, determine a crush stiffness 5 coefficient? 6 A Yes. 7 Q All right. And how did you do -- use 8 this? There's a part that's highlighted. How is 9 this used in your crush analysis? 10 A For the crush stiffness of the pickup, 11 this is the crush stiffness that we used. We 12 needed those values for the calculations in the 13 analysis that we did. So this is the source. 14 Q And this represents the crush stiffness 15 of the front bumper of the F250? 16 A The front of the F250 which is generally 17 expressed at the bumper level, yes. 18 Q And how did you determine the crush 19 stiffness of the rear bumper of the Escape? 20 A Well, we did two things. 21 No. 1 is there's an essay paper, I 22 believe, that gives the class of vehicle that it 23 is. 24 And then when we ran the engineering 25 dynamics programs, they had stiffnesses in the</p>	<p>1 this? 2 A You are and you aren't. You're -- I 3 think technically from a -- there's a good 4 understanding there on your part. 5 We have to choose where to measure the 6 crush elevation, although, there's crush above and 7 below it. 8 We choose a bumper level to measure it so 9 that when we calculate the stiffness coefficients, 10 they're representative of crush above and below the 11 bumper, but we measure it at the bumper level. 12 So we're going to be expressing bumper 13 level crush using the calculation -- one of the 14 calculation methodologies we did. 15 But it's not just confining it to the 16 bumper level, but it's just part of the protocols. 17 Q And that's all I was trying -- that makes 18 sense. 19 A Okay. 20 Q So if the height of your crush or 21 deformation calculations is basically at the bumper 22 level, that's -- correct? 23 A Yeah. The answer is given at bumper 24 level, yes. But we can adapt it to other levels, 25 but it's -- the standard protocol is you're --</p>
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<p>1 program already for 2008 Escapes, and we used 2 those. 3 So we actually ranged it based on two 4 different sources. 5 Q This is for the rear bumper of the 6 Escape, not the rear hatch? 7 A Well, it's the rear. When you do crush 8 stiffness, you don't have to -- you're talking 9 about one side of the vehicle. 10 You can do side stiffness, you can do 11 front stiffness, you can do rear stiffness. 12 But we typically measure crush at the 13 bumper level when calculating stiffness because 14 that's the part that's designed to take the crash. 15 We can do it at other elevations, but 16 when you look at something like the Neptune data 17 where the crush stiffness is in the papers like we 18 used for the Escape, you're going to see that, you 19 know, they're -- they're based on bumper level 20 crush meaning -- but it extends above and below 21 that, but the measurements are at the bumper level 22 as part of the protocol. 23 Q So basically the height is -- would be 24 the height of the bumper that you're using as far 25 as -- is that right? Or am I misunderstanding</p>	<p>1 you're looking at bumper level-type crush. 2 Q So when you're doing these calculations, 3 the items in the cargo area are not going to factor 4 in when you got to determine crush because they're 5 above the height of the -- of the calculations; is 6 that fair? 7 A No. 8 Q Okay. How am I wrong about that? 9 A Pardon? Pardon? 10 Q Well, how -- how am I incorrect in that 11 statement? 12 A It does include -- first, cargo should 13 not be part of the strength of a vehicle. If it 14 is, then that's -- you know, that's -- that means 15 that we're not really doing a good job at designing 16 our vehicles or managing our -- our crashes. 17 But the hatch area and damage to it and 18 the seat fillers and all of that is included in the 19 crush stiffness coefficients. The strength of 20 those do affect those coefficients. 21 But the protocol is to measure the static 22 crush at the bumper level even though we know 23 there's going to be crush above and below there. 24 It's just the protocol that Campbell and 25 everybody came up with when they were developing</p>

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<p style="text-align: right;">Page 134</p> <p>1 this methodology. 2 We could -- we can adapt it and do it 3 other different ways. We -- but, no, the standard 4 way is to do it. 5 Just like, you know, when you want to 6 learn how tall somebody is you take their shoes 7 off, but most of us are measured with our shoes on 8 at the doctor's office. It's okay. 9 Q And I just want to make sure I 10 understood. 11 So there's no way to account for any 12 stiffness or any impact of the cargo in the crush 13 analysis? I mean, that's just -- that's your 14 opinion, it's not what you do? 15 A It's never done because -- 16 MS. CANNELLA: Hold on. Object to the 17 form of the question as vague. 18 BY MR. HILL: 19 Q Go ahead. 20 A I would say it would -- you could do it, 21 but it would be a little bit unusual to be thinking 22 that what was in the cargo area was adding to the 23 strength of the vehicle. In this case I'm sure it 24 effectively didn't. 25 I mean, I can pick up the -- the shop vac</p>	<p style="text-align: right;">Page 136</p> <p>1 that seat, we're not using it because in a normal 2 crash it's not involved. 3 In the normal crash the strength of the 4 seat is -- is held to the -- protecting the 5 occupant and part of them. 6 It's not part of the -- it's not part of 7 defending the outside of the vehicle bumper, rear 8 bumper, from a rear impact. 9 So, you know, we're mixing apples and 10 oranges here, but in this case we measure it so we 11 can show how far it when in. 12 But when we -- but we're not calculating 13 how strong that seat is because in the normal event 14 it's not involved in the crash. 15 Q And when you say "normal event," you mean 16 when there's no bumper override, that -- is that 17 what you mean by the term "normal event"? 18 A When the bumper is on top of where I'm 19 sitting, that's an abnormal event. 20 The truck -- the bumper of this truck 21 made it in. It doesn't -- however we want to call 22 it. I'm not trying to -- in this crash, that's all 23 I'm talking about, is the bumper was in the rear 24 seat occupant space where the person used to be 25 sitting. That's abnormal.</p>
<p style="text-align: right;">Page 135</p> <p>1 and tap it on the side and grab it and bend it with 2 my arms. There's no way that -- that we would 3 include that in there reasonably. 4 But if you did want to and there was 5 something in there like, I don't know, something 6 uncrushable, you know, a -- you know, a safe, then, 7 yeah, we could -- we could include that in there. 8 But it's in -- but, no, it's not included 9 because it's not reasonable to include under every 10 situation I've ever been a part of. 11 Q All right. You know, when you talk about 12 the deformation of the rear seat, that would be 13 impacted by items in the cargo area? 14 A Yes. 15 Q All right. And -- and did you factor 16 that in when -- in any part of your analysis, the 17 effect of the cargo on the deformation of the rear 18 seat? 19 A Yeah. Well, yeah, because that's -- we 20 measure that and we show that and we show the rear 21 seat was pushed forward. That's an observation. 22 You know, that -- that clearly affected 23 the survivability of the crash for the occupants. 24 The occupant space was crushed in. 25 But as far as calculating the strength of</p>	<p style="text-align: right;">Page 137</p> <p>1 In the normal event, we got stock 2 vehicles that hit each other and we can calculate 3 what that is. 4 So we observe the abnormal event because 5 it's not normal and then we also can calculate the 6 normal event which has got a bumper-to-bumper hit. 7 If someone wants to analyze other things 8 in between, that's fine. We can go try to do that, 9 but those are the only two things we're looking at 10 here. 11 Q Yeah, I think you answered. I'm just 12 saying when you say "normal event," you mean a 13 bumper-to-bumper impact? 14 A Of stock vehicles, yes. 15 Q Yeah. 16 A Let's say normal like would have happened 17 in this crash with stock vehicles. 18 Q Let me pull up your report again. 19 A Yes, sir. 20 Q All right. This is Page 11 -- or I'm 21 sorry, Page 10 of your report, Bryson 1359. 22 And the first bullet point under Analysis 23 and Conclusions is "The F250 was effectively lifted 24 over 6 inches." 25 Do you know how far the frame rails were</p>

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<p style="text-align: right;">Page 138</p> <p>1 lifted in the -- in the subject vehicle as compared 2 to a factory F250? 3 A A lot of different questions in there. 4 But the frame rail -- in the simplest analysis, 5 this truck was measured -- was, I think, lifted 6 between 6 and 6 1/2, but over 6, probably less 7 than -- close to 6 1/2. 8 So if we take off the point, I think it 9 was 0.4 inches. Let me look at my table here. 10 Yeah, 0.7 inches for the tires would be 11 -- if you take the tires out of it, you would be 12 somewhere above probably 5 1/2 inches or near 13 5 1/2. 14 However, we can also add back in, you 15 know, the -- we don't want to miss if the lift kit 16 recommended larger tires than were even on the 17 accident truck. 18 So, you know, it's -- so if you -- if you 19 just put the stock tires on, you would be down to 20 around 5 1/2. If you -- with the frame and the 21 lift kit. 22 Q I guess the answer is 5 1/2? 23 A Around 5 1/2, yes. 24 Q All right. And you didn't actually 25 perform any calculations or measurements to</p>	<p style="text-align: right;">Page 140</p> <p>1 to the stock tire size. 2 And then that will give you the frame 3 with stock tire. The actual distance the frame 4 moved up absent the tires. 5 Q You have a comment in here about the F250 6 bumper, and is the second bullet point, how far it 7 penetrated into the rear of the Escape. 8 Is that based upon the deformation in the 9 rear seat or what is the basis for your conclusion 10 that the bumper actually went so far in that the 11 child seat was pushed forward by over 18 inches? 12 And I'm trying to understand how you 13 determined the location of the bumper at its 14 maximum intruding level? 15 A We fit -- yeah, that's a -- let me read 16 here. 17 Yeah, that's the static analysis. We 18 basically fit the bumper of the truck on to the 19 tailgate in the damaged condition after they have 20 rebounded. And we fit those two together. 21 The front bumper of the truck is 22 literally -- and then we compare that to an 23 uncrushed Escape -- and the bumper is literally, 24 you know, in -- in -- in the rear seat area of the 25 truck -- I mean, of the Escape.</p>
<p style="text-align: right;">Page 139</p> <p>1 determine that, that's just an estimate? 2 A No, I calculated it and we got six -- we 3 -- so I -- yeah, I did calculations based on the 4 ranges I had just then. 5 Q You just calculated it during the 6 deposition yourself? 7 A Yeah. Yeah, I did. 8 Q Okay. But there's not -- 9 A To answer your -- to answer your 10 question. 11 Q Yeah. I was just looking for any 12 calculations in all the materials you -- you -- you 13 found. 14 A Thank you. I misunderstood. 15 Q And I guess you're saying that there's no 16 sheet that I can look to that shows those 17 calculations other than just being done by you 18 prior to the deposition? 19 A Yeah. 20 Q Fair? 21 A What you do is you look at the lift that 22 we calculated and then subtract 0.7 inches. 23 Q All right. 24 A So you take what we already calculated 25 and measure and then you subtract 0.7 inches to get</p>	<p style="text-align: right;">Page 141</p> <p>1 That's where it is when you just do a 2 geometric matching of the two. 3 Q And you're talking about using crush 4 standards (inaudible) to place the bumper of the 5 F250 and it's (inaudible) of components of the 6 Escape other than the seat? 7 I mean, what -- what are -- what is 8 the basis for your -- that comparison, 9 that (inaudible)? 10 MS. CANNELLA: Did you hear that whole 11 question? I didn't hear it. You cut out a little 12 bit. 13 Could you read back the question, Madam 14 Court Reporter, I couldn't hear it. 15 THE COURT REPORTER: I need it repeated, 16 Mr. Hill. 17 MR. HILL: I'll repeat it. Hopefully it 18 is better this time. 19 BY MR. HILL: 20 Q When you overlay, as you just mentioned, 21 based upon the crush that you observed, you placed 22 the 250 in sort of its position at its maximum 23 intrusion. Based upon an overlay. 24 And my question is, how do you determine 25 from the overlay the full extent of the intrusion</p>

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<p style="text-align: right;">Page 142</p> <p>1 of the bumper?</p> <p>2 A You -- you know the original seat</p> <p>3 geometry from the inspection of the exemplar. You</p> <p>4 know where it's located. And then you know from</p> <p>5 the damaged vehicle how far the crush went forward.</p> <p>6 And from those we can see that it's</p> <p>7 invading the occupant's rear seat area. It's just</p> <p>8 a simple fit the Legos together problem.</p> <p>9 Q How -- I'm sorry. You -- I didn't mean</p> <p>10 to --</p> <p>11 A That's all it is.</p> <p>12 Q And that's exactly what I was getting at.</p> <p>13 Is that it's a measurement of the deflection of the</p> <p>14 seat and you're using --</p> <p>15 A We can do the -- we did do the deflection</p> <p>16 of the seat and we can do that. But -- but I think</p> <p>17 what you're asking about is, how do we know how far</p> <p>18 the bumper went in?</p> <p>19 That's just -- that's just a pure</p> <p>20 measurement from -- or the fitting of the pieces</p> <p>21 together and then comparing it to what they used to</p> <p>22 look like before they were deformed.</p> <p>23 Q Right. So -- and what was deformed is</p> <p>24 the seat. And so you're measuring how far the seat</p> <p>25 was pushed in?</p>	<p style="text-align: right;">Page 144</p> <p>1 that you're measuring it based upon the damage to</p> <p>2 the rear hatch and the location of the rear hatch,</p> <p>3 not the location of the seat. That's what I was</p> <p>4 trying to get.</p> <p>5 And I thought you earlier said that you</p> <p>6 calculated by overlay based upon the movement of</p> <p>7 the seat.</p> <p>8 But now I think I'm hearing you saying</p> <p>9 that it was -- the bumper intrusion was calculated</p> <p>10 based upon the damage to the hatch and the location</p> <p>11 of the hatch?</p> <p>12 A I think you've changed -- I think you've</p> <p>13 changed your question on me and are claiming you</p> <p>14 didn't, but -- it's okay, it doesn't matter, the</p> <p>15 answer is still the same.</p> <p>16 You look at the macro damage on the</p> <p>17 vehicles and match them together statically and</p> <p>18 then dynamically and then you just look -- look</p> <p>19 where the seat used to be and also where the seat</p> <p>20 is to write these sentences that are on here.</p> <p>21 Q Okay. But the -- the seat is obviously</p> <p>22 going to be impacted by the cargo which is between</p> <p>23 the bumper and the seat.</p> <p>24 And so my point is, you can't measure the</p> <p>25 full intrusion of the bumper as it's impacting the</p>
<p style="text-align: right;">Page 143</p> <p>1 A No, we're not. Well, we can.</p> <p>2 Okay. What -- see, you think we're</p> <p>3 measuring to the seat. Here we're -- we're just</p> <p>4 using the damage on the vehicles as a whole to</p> <p>5 locate where the bumper is during the crash.</p> <p>6 We -- we know the seat's been moved</p> <p>7 around. We -- we locate where it is during the</p> <p>8 crash either statically or dynamically.</p> <p>9 And then we compare that to where the</p> <p>10 seat started out. And the seat started out behind</p> <p>11 where the bumper of the truck is.</p> <p>12 In other words, I'm not doing it from how</p> <p>13 far -- I could do it by how far the seat moved, but</p> <p>14 that would be maybe not as accurate and be very</p> <p>15 complex.</p> <p>16 But we can simply do it from the -- from</p> <p>17 the crush on the rear hatch and where it moved to</p> <p>18 and -- and the front bumper on the truck and match</p> <p>19 them together and know that they're sitting in the</p> <p>20 rear seat where the rear seat used to be.</p> <p>21 If you know the bumper of the truck is</p> <p>22 sitting where there's -- where the seat used to be,</p> <p>23 then you know that the rear seat was invaded and</p> <p>24 moved.</p> <p>25 Q Okay. Back to what I'm getting at. Is</p>	<p style="text-align: right;">Page 145</p> <p>1 location of the seat without also factoring in the</p> <p>2 cargo that was between -- will be between the</p> <p>3 bumper and the seat.</p> <p>4 And I think that's what you alluded to</p> <p>5 about it being too complex of a -- an analysis</p> <p>6 to -- to complete.</p> <p>7 A I disagree. I think you're -- I think</p> <p>8 you're twisting it in a way that I don't fully</p> <p>9 understand.</p> <p>10 You -- we know the cargo is in there and</p> <p>11 we know it was flattened, but, you know, we -- we</p> <p>12 don't agree with your statement in your question.</p> <p>13 Again, I don't understand it, but I can't</p> <p>14 agree with it, but I don't understand it either.</p> <p>15 Q Well, maybe I'll try a little bit better</p> <p>16 and then we'll move on.</p> <p>17 But you're talking about (inaudible.)</p> <p>18 You can place the bumper at its maximum intrusion</p> <p>19 based upon the physical condition of the Escape,</p> <p>20 right? We agree on that?</p> <p>21 A Sure.</p> <p>22 Q And I'm trying to nail down what physical</p> <p>23 attributes of the Escape are you relying upon to</p> <p>24 perform that overlay to put the actual Ford emblem</p> <p>25 from the F250 on top of the head area of the cargo</p>

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<p style="text-align: right;">Page 146</p> <p>1 -- of the child seat. 2 What specific parts of the Escape are you 3 referencing to make that overlay? That's what I'm 4 trying to get to. 5 A Okay. In the static condition after 6 everybody's crashed and crushed and kind of sprung 7 back a little bit, we use the imprint of the bumper 8 on the rear hatch primarily. 9 So it's just a -- take the front bumper 10 of the truck, slide it forward until it marries up 11 on the rear hatch damage imprint of the bumper. 12 You've got tow hooks and other things that are 13 helping you line all of that up. 14 That's -- that's just a static crush 15 after the accident. 16 But we also know that the roof of the 17 Escape came down and left two holes in the hood of 18 the truck. Meaning, that the hinges for the rear 19 hatch literally came down and hit in the roof and 20 made two very specific marks and poked holes in it. 21 So those -- those are 6 inches -- a 22 little over 6 inches from the static crush. So the 23 truck had to move an additional 6 inches forward 24 into the Escape for those marks to be left. 25 So we take our static crush, plus a</p>	<p style="text-align: right;">Page 148</p> <p>1 determine the full extent of the crush from the 2 F250? 3 A Yes. And there is -- 4 Q Okay. 5 A We look at all parts of it at the same 6 time, but, yeah, that's the easiest explanation and 7 most straightforward and that's -- that's how we're 8 doing it. 9 Q And that's shown on this Page 10 when you 10 say that "the bumper penetrated 4.36 feet into the 11 rear hatch trunk and rear seat position areas"? 12 A That's what I said. 13 Q You've just explained how you came up 14 with that number? 15 A Yes. 16 Q Okay. On the top of Page 11, that bullet 17 point when you say that in the stock configuration, 18 the crush would have been reduced by nearly 1/2 or 19 over 2 feet, you're talking about the static 20 measurement of the crush in that bullet point, 21 right? 22 A It'll apply to both. 23 Q All right. I'm trying to find something. 24 A I'm going to stand up for a second. I'm 25 more comfortable standing sometimes. I'm just</p>
<p style="text-align: right;">Page 147</p> <p>1 little over 6 inches, I think it is, to get a 2 dynamic crush. 3 And so we can draw a truck and Escape 4 that are matched together statically and then we 5 can move that truck in there another 6 inches and 6 show the dynamic. 7 And then once we -- once we move it in 8 there, then because we -- we've got both the 9 vehicles in a 3D dynamic -- 3D world where we can 10 look at them and dynamically rotate them. Not move 11 them, but just rotate them like on video and look 12 at them, we can see that the Ford logo is sitting, 13 you know, basically where the headrest area of the 14 child's seat used to be. 15 Q Okay. That was exactly what I was 16 getting at. So you're -- you're using crush in the 17 hatch to establish the static extent of the -- of 18 the -- of the crush. And then the imprints from 19 the hatches, the -- the seats or whatever you call 20 the -- 21 A Hinges. Hinges. 22 Q Hinges of the hatch where they impacted 23 the hood of the F250 to determine your dynamic 24 crush beyond the static crush, and those two 25 references on the Escape are what you're using to</p>	<p style="text-align: right;">Page 149</p> <p>1 going to do this and I apologize. I hope it will 2 work out okay. I don't know if there's a 3 deposition requirement that the deponent sit. 4 Q All right. I'm sharing the screen. 5 I'm showing a photograph that's been marked 6 IMG 1125.jpg. 7 This is taken from the photographs that 8 we have in your file. I don't have the Bates label 9 number of it, but it -- it obviously can be 10 identified by the photograph number. 11 You said upon your -- on Page 11 of your 12 report that "The Escape bumper level support 13 structures were largely intact"? 14 A Yes. 15 Q Can you point out in the photograph if 16 the bumper level support -- support structures are 17 largely intact? 18 A Sure. The two gray things kind of 19 sticking down -- no, they're closest to the tires 20 on the left. 21 Q Here and here (indicating)? 22 A On the left closest to the tire and on 23 the right -- yes, those two on the right. You 24 know, you have to go across the bump -- the 25 muffler.</p>

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<p style="text-align: right;">Page 150</p> <p>1 But, yeah, those are -- those are the 2 rails of the unibody and they're pushed down and 3 the bumper was torn off of them, but they didn't -- 4 they didn't -- they didn't crush forward like we 5 expect to see in a rear-end collision based on, you 6 know, my years of experience. 7 Q So when you say they're largely intact, 8 that's based upon they were not pushed forward as 9 much as you would expect based upon your 10 experience? 11 A Yeah, relatively speaking, they're -- 12 they're there to defend the vehicle and absorb the 13 forces and they didn't do that. So it's a relative 14 term, yes. 15 They're -- they're certainly not usable 16 in a new car or anything, but they're relatively 17 intact compared to what we see in rear-end 18 collisions when they get to perform helping to 19 defend the -- the vehicle. 20 Q All right. Whoops. I'm going back to 21 your report. 22 All right. This is Page 11 of your 23 report where you are listing the maximum g's for 24 the F250 and the maximum for the Escape. 25 A Can you share, please?</p>	<p style="text-align: right;">Page 152</p> <p>1 a reasonable range. 2 Q And how would you describe those two 3 methods? What -- what were the -- I'm confused by 4 that a little bit. 5 A Sure. Well, one's a calculation based on 6 Campbell's original formulas and the SAE training 7 courses I've been to and the Northwestern courses 8 where you -- you calculate based on static -- 9 static crush. 10 And the other is the simulation with 11 EDSMAC. 12 And then you also just use standard, you 13 know, physics calculations from accident 14 reconstruction to help relate the delta-Vs that 15 were measured in the accident to the delta-Vs based 16 on the -- the weight ratios and whatnot of the 17 Escape. 18 So that's -- that's -- that's 19 fundamentally just physics relationships where data 20 is known and you want to derive more data from it. 21 So there's three -- really three 22 different methodologies in calculating the numbers. 23 Now, that's a part from measuring which 24 is what -- what we did for crush of the accident 25 vehicle in the accident itself.</p>
<p style="text-align: right;">Page 151</p> <p>1 Q Oh, I'm sorry, I thought I was sharing. 2 My bad. 3 All right, can you see it now? 4 A Yes, sir. 5 Q All right. When you say "The Escape was 6 near 23.6 g's," what do you mean by that? What -- 7 did you have to make an actual calculation of it? 8 A Yes. Numbers don't always model reality 9 perfectly. We try to, you know, use a reasonable 10 value. 11 The F250 reported a value of 10.4 based 12 on its weight. The Escape's based on our weights 13 and the calculation would be near 23.6. It could 14 be 23.8, could be 23.2, could be, you know, 15 something in that range, but it's -- that's our 16 best number. 17 Q Can you perform any type of analysis and 18 check for calculations like a Monte Carlo analysis 19 or anything like that? 20 A We -- we chose a different method. We 21 basically used three -- two different methods and 22 the two methods gave us a range, so we use that. 23 You know, we -- we could -- we can do it 24 Monte Carlo, but in this case we -- because we used 25 two different methods we believe that that gives us</p>	<p style="text-align: right;">Page 153</p> <p>1 Q The very last bullet point on this page, 2 Page 11, just so I understand it. 3 When you refer to calculations in that 4 paragraph -- that bullet point, you have the crush 5 analysis calculations we looked at for -- they may 6 be up here but maybe not -- but that's when you say 7 calculations, you're talking about the crush 8 analysis calculations that we've already talked 9 about; is that correct? 10 A Yes. 11 Q Are there any other calculations that 12 support that bullet point? 13 A No, that's what I'm using. 14 Q Okay. And then when you say simulations, 15 you're talking about HVE; is that correct? 16 A Yeah. Yes. 17 Q Now, did -- that uses the plural of that. 18 It's my understanding there was just one 19 simulation that you ran of the hypothetical 20 instance of a stock configuration on the F250 being 21 involved in this accident. 22 Was there more than that or is there more 23 than that one simulation? 24 A There's only that one. Remember, I told 25 you that when we started it we needed to refine it</p>

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<p style="text-align: right;">Page 154</p> <p>1 to produce the output data that matched the F250. 2 So, yeah, when you first put it in, you 3 have to -- it takes a little bit of work to get it 4 to the proper simulation. 5 So that's -- that's the reason I think 6 there's an S in there. It's -- we really weren't 7 thinking about it when we wrote it because we're 8 just using the one final one, but that's a 9 reasonable explanation. 10 Q All right. Are the prior simulations 11 that you ran, were they saved in any way? 12 A No. If someone wants to rerun them, 13 they're pretty easy, you just -- I mean, it's -- 14 it's a piece of cake. Like I told you, there's 15 really only one number that we changed and that's 16 the relaxation which affects the restitution which 17 I'm basically changing the restitution. 18 So if someone wants to back -- back work 19 it, they can. 20 Q Sure. But you didn't keep up on all of 21 like what restitutions you used in the prior 22 simulator? 23 A No. We would have basically used an 24 iterative process -- an iterative process to get 25 the answer to match the download.</p>	<p style="text-align: right;">Page 156</p> <p>1 We're letting the program do its thing, 2 but we're giving it a little bit of guidance. 3 Q If you have the program, how -- how does 4 that DyMESH algorithm work? 5 Do you know how to explain it in -- like 6 if you have to explain it to the jury, I'd love to 7 hear what your explanation will be for how that 8 algorithm works. 9 A Okay. Well, as I said earlier, it's 10 based on crush stiffness coefficients that are 11 derived standardly by measuring damage at bumper 12 level. 13 But then this particular algorithm looks 14 at the -- at the whole surface of the front of the 15 vehicle and -- and tries to do -- take into account 16 all of the forces. 17 So it actually discounts those AV values 18 and more or less spreads them out across the front. 19 And then it's just going to do some of 20 the forces between the -- the back of the Escape 21 and the front of the truck and it's going to say 22 that the forces are always balanced. 23 And it's going to determine those forces 24 from the AV values, which are the strength. 25 But it's also going to use the geometry</p>
<p style="text-align: right;">Page 155</p> <p>1 Q When you say "match the download," just 2 so I understand that, what actual data from the 3 F250 download are you trying to match in running 4 the HVE stimulator? 5 A The impact speed and the exit speed. 6 Q Right. Any other data you're trying to 7 match? 8 A No. 9 Q Okay. So you basically change around the 10 coefficient of restitution until you max those 11 speeds, and then that's what gives you confidence 12 that you've got the proper inputs from the HVE 13 simulation? 14 A Well, we -- you know, we -- we work on 15 the vehicle itself, geometry, and all of that. 16 We're not talking about that. 17 From a calculation perspective, yes, we 18 use -- we -- we put in the crush stiffness 19 coefficients, which we've talked about. 20 Q Right. 21 A And then we put in the impact speed and 22 then we vary the restitution or what's also called 23 the relaxation in that particular program to 24 produce the 17.92 delta-V, I believe it is, or 25 17.93. Yes, that's -- that's all we're doing.</p>	<p style="text-align: right;">Page 157</p> <p>1 of the vehicles that are -- are -- that DyMESH 2 uses. 3 You get an accurate geometry and so it's 4 actually trying to look at the overall contact 5 surfaces, not just the bumper level model. 6 Excuse me, let me turn this off. 7 Q Go ahead. 8 A My apologies. 9 So it's -- you know, it's just -- it's -- 10 you used the word "complicated" earlier. It's a 11 more complicated calculation, more sophisticated 12 calculation. 13 But it gives virtually the same answer 14 that we do it -- when we do it the -- the more 15 classical way using the -- the calculator. 16 Q Does DyMESH know the location of the 17 vehicle structures such as the frame rail over 18 where the bumper would be? 19 A It -- it -- it does not. You do not tell 20 it, you know, exactly where the rails are or 21 anything like that. 22 It's -- just like in the standard 23 calculation, you're -- you're giving it 24 measurements at -- at a height that are usually 25 bumper level but they don't have to be bumper</p>

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<p style="text-align: right;">Page 158</p> <p>1 level, so. 2 But it's -- so really it's -- it's a 3 variation of what we normally do, but it's doing it 4 by looking more at the area as opposed to more of a 5 contact line. And that's really the difference to 6 it. 7 And engineering dynamics has their own 8 algorithm for doing that. And they -- they, of 9 course, appreciate bumper level in -- when they 10 develop their algorithm. 11 But I don't think we're telling DyMESH -- 12 we're not telling it, it's their algorithm that's 13 -- that's including it in their -- in their 14 algorithm. 15 Q The algorithm basically assigns one 16 stiffness coefficient to the entire front or rear 17 end or whatever it's analyzing; is that correct? 18 A Yes. 19 Q And you can't modify that or change that 20 based upon the impact location in a particular 21 simulator? 22 A Oh, well, you know, you could try to. 23 You could try to. But then, again, you've got to 24 be careful where -- you're probably taking the 25 program outside the areas what it's been designed</p>	<p style="text-align: right;">Page 160</p> <p>1 be done or can't be done. I'm just saying we're 2 not doing it and I don't -- I'm not aware of a way 3 to do it, but doesn't mean that someone couldn't -- 4 couldn't do it. 5 Q Maybe I'll ask it another way: If the 6 program doesn't know where the bumper or spring is 7 located on either vehicle, how can it determine 8 whether there was an override condition in the -- 9 A Well, first, it shouldn't be using an 10 override and nobody is using an override. And if 11 anybody is, I think they're -- they're -- they're 12 off the reservation and then they have to become 13 responsible for -- for that work, in validating 14 that work. 15 And there's probably ways to do that, but 16 we don't -- we haven't done that. 17 So there -- it's not an override in the 18 engineering dynamics calculation and we didn't 19 intend it to be an override and it's not looking at 20 override. 21 The accident one is an override and we're 22 looking at that ourselves. We're not trying to 23 take a program, you know, outside of what it's -- 24 of what we consider a fairly normal collision. 25 Q All right. So you didn't use them to</p>
<p style="text-align: right;">Page 159</p> <p>1 to be used, and then you would have to just take 2 responsibility for -- for controlling that. 3 In this case we're not, we're just using 4 it exactly as how it was designed to be used. 5 We're just using it as another calculation tool. 6 But if you get -- if you -- if you go 7 very -- very far afield, then, yes, you would run 8 into considerations that we didn't have to make. 9 Q It's my understanding that the program 10 doesn't allow you to make those type of changes. 11 You can't adjust the stiffness coefficient to a 12 particular point on the vehicle, correct? 13 So you couldn't even run that type of 14 simulation if you wanted to using the program? 15 A Look, we're not doing that and I'm not 16 trying to get into that. But, you know, there are 17 things you can do to these programs to influence 18 beyond just the simplified observation that you're 19 making here. 20 That's what I'm saying you shouldn't be 21 doing. And if you do, then you're totally 22 responsible for it. 23 But, you know, every -- every computer 24 program, you know, can be affected if one wants to. 25 And I'm not -- and I'm not saying it can</p>	<p style="text-align: right;">Page 161</p> <p>1 predict there would be no override in the 2 simulation with the stock, you assumed that there 3 would be no override based upon all the reasons we 4 talked about that form your opinion that there 5 wouldn't be an override in the F250 stock 6 configuration? That's all I'm trying to get at. 7 A Yeah, you're also trying to insert some 8 words in there that I can't agree with. 9 Fundamentally, the program's not designed 10 to tell me if it was an override or underride. 11 It's designed to tell me the crush at 12 whatever elevation I wanted to hit and I wouldn't 13 use it if I knew there was an override because I 14 don't -- I'm -- not normally use it, that means 15 there -- there might be a situation where you 16 couldn't use it to study something or observe 17 something. 18 But in this case, it's Bryant Buchner 19 that is letting the bumpers hit and it's letting 20 DyMESH calculate it. And DyMESH and engineering 21 dynamics intend it to be a normal collision. 22 I'm not taking an abnormal collision, I'm 23 -- I'm not validating in any shape, form or fashion 24 that it should be used for that. 25 Although, someone might manipulate</p>

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<p style="text-align: right;">Page 162</p> <p>1 certain things to try to understand something for a 2 crash and that might be okay, but that would be on 3 their hands, not on mine. 4 Q Perfect. Can the -- can DyMESH predict 5 the twisting and collapsing of -- of vehicle 6 components? 7 A It doesn't -- it doesn't -- it's -- we're 8 not telling it -- the answer would be you might 9 could observe something that you could -- depending 10 on the shape of the vehicle and what vehicle's in 11 it, you could observe twisting or effectively 12 twisting. 13 But no, there -- it doesn't have frame 14 rails in it. It's not -- it's -- it's using -- 15 that would have to be something you would conclude 16 based on the data. It's -- it's not going to tell 17 you that something twisted, no. 18 Q Okay. Same thing, there's no mechanism 19 for DyMESH to distort the shell of how it might 20 pull on other parts of the vehicle? It's not 21 capable of doing that either? 22 A No. 23 Q And -- and we obviously know that 24 components could be pulled and twisted, they 25 collapse and rotate during a crash, but that's not</p>	<p style="text-align: right;">Page 164</p> <p>1 So it's just one of our many tools. I 2 don't remember every time I've used it, but crush 3 is normally one of the reasons why I use it because 4 I'm -- I'm interested in what it says about crush, 5 I'm interested in -- in -- in exploring crush. 6 Q What other -- like PC-Crash and Brock 7 Brothers, would you use those to determine crush? 8 A No, I wouldn't. No. But -- I'm not 9 saying you couldn't do it, but I'm -- I usually 10 don't. I usually use PC-Crash as a dynamics and 11 also a momentum-based analysis. 12 That's what I prefer it for, but, you 13 know, we can -- we can -- not saying we haven't 14 used it. 15 Q Sure. But HVE, I guess is what you're 16 saying, is your primary simulation tool if you want 17 to explore crush? 18 A Without knowing anymore about it, if -- 19 if I just want to look at crush, I -- I tend to 20 like to use HVE because it tends to give me 21 information that I can use about crush. 22 Q Assuming there's never been a situation 23 where you -- your use of HVE to analyze crush was 24 excluded, you know, by a court; is that correct? 25 A That is correct. That is correct. There</p>
<p style="text-align: right;">Page 163</p> <p>1 part of the DyMESH -- 2 A Well, it is but indirectly. It's -- it's 3 -- it's not looking at those components being 4 twisted as you're saying, but it is -- it is 5 representing the crush of the vehicle, which is 6 what we do. It's what we chose to do a long time 7 ago was measure the crush and it's representing the 8 crush. 9 Why the crush is happening and how it's 10 happening involves twisting of metal and all that 11 other stuff that's going on. 12 But we don't have to -- that's called 13 finite element analysis when someone wants to model 14 that and, you know, that -- that can be done, but 15 that's a different methodology. 16 It doesn't invalidate the -- the 17 Engineering Dynamic simulation programs, it's -- 18 it's actually, you know, been shown to be robust. 19 Q Prior to this case, have you used HVE in 20 any other cases to simulate crush? 21 A I mean, I -- I don't remember all the 22 times I've used HVE. We normally use it to look at 23 crush, and if we're not concerned about crush, we 24 might use PC-Crash. Or there's Brock Brothers has 25 a calculation simulation program.</p>	<p style="text-align: right;">Page 165</p> <p>1 aren't any situations like that. 2 Q And do you specifically recall situations 3 where you used HVE to analyze crush in a trial 4 where that evidence was actually admissible and 5 used by them? 6 A As I sit here, I don't remember any. 7 Q Okay. 8 A Or as I stand here, excuse me. 9 Q Do you recall whether you -- that use of 10 HVE in a -- as testimony in a case or as evidence 11 in a case whether that's ever been challenged based 12 upon Daubert or any other reason? 13 A I've been using H -- I've been using 14 engineering dynamics programs for 30 years, over 30 15 years. It's been part of our regular work. I 16 don't ever remember it being a problem. I tend to 17 remember problems more than I do things that aren't 18 problems. 19 So my best answer is I don't -- when it 20 was appropriate, we used it, or one of the other 21 programs, and I haven't had an issue with it 22 because I try not to use it unless I believe it's a 23 reasonable representation for the study I'm trying 24 to perform. 25 Q And what I'm getting at is, if you faced</p>

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<p style="text-align: right;">Page 166</p> <p>1 a challenge like that before, you may have 2 collected articles, peer-reviewed studies, or other 3 material that would support your argument that 4 using HVE to study crush is a reliable, scientific 5 method for simulating, you know, crush in a 6 hypothetical case. 7 It sounds like you haven't done that; is 8 that correct? 9 A I really haven't done that because I've 10 been using it for so long and I try to stay up -- 11 up-to-date on what's going on. 12 So, I mean, I -- I feel like I -- I 13 haven't and I -- I don't remember having -- 14 remember having an issue with it. 15 Q All right. 16 A I'd be surprised if there's going to be 17 an issue here, but I'll look at it if it comes up. 18 You know, it's -- it's just a 19 straightforward use of a program that's available, 20 been around for 30 years and it's well-respected in 21 the industry. 22 I don't have any problem using it for 23 this. I don't expect anybody else to, but if they 24 do, I'll have to address it. 25 Q So as we sit here today, you haven't</p>	<p style="text-align: right;">Page 168</p> <p>1 MR. HILL: That's right. As he's done in 2 this case. Meaning, what support would he have 3 that that's a reliable scientific method to support 4 his opinions in this case. 5 MS. CANNELLA: Okay, object to the form 6 of the question. 7 A Okay. Well, first, you distorted. When 8 you -- when you have the override you had, that can 9 get a little complex. 10 We know exactly what's going to happen in 11 that because we have the measurements of it. We 12 don't have to guess at other things. It's just all 13 right there. 14 But when you have the bumper-to-bumper 15 stock vehicle, that's a normal crash. That's -- 16 that's as ho-hum as it gets. This is -- this is 17 maybe the simplest crash I've had all year. A car 18 stopped, a truck runs into at 52 miles an hour. 19 HVE, if it can't do that, then it can't 20 do anything. I mean, that's -- that's -- that's 21 what it's designed for. 22 And then if you go look in the 23 literature, I mean, I've already pointed you over 24 there to Northwestern. Northwestern teaches that 25 it's -- that it's a good program to use in crash</p>
<p style="text-align: right;">Page 167</p> <p>1 selected any material that would support -- that 2 indicates, that you can apply it back to this case, 3 would be a reliable methodology for analyzing 4 crush? 5 MS. CANNELLA: I'm sorry, can you repeat 6 that? I couldn't hear it. 7 MR. HILL: Sure. 8 BY MR. HILL: 9 Q What I'm getting at is, as we sit here 10 today you can't cite me to any peer-reviewed 11 articles or any other sources that would support 12 using HVE to analyze crush in a case like this one? 13 MS. CANNELLA: Object to the form of the 14 question as vague. "Case like this one" is unclear 15 what you mean. 16 BY MR. HILL: 17 Q I've tried to establish it multiple 18 times. In a case where you're analyzing a complex 19 crush situation in a hypothetical simulation 20 involving vehicles that were not involved in the 21 actual crash itself, if that helps to define it? 22 MS. CANNELLA: You're asking him if he 23 has any papers that say you can use HVE to simulate 24 a complex crash situation in vehicles not in the 25 wreck?</p>	<p style="text-align: right;">Page 169</p> <p>1 reconstruction and it mentions, you know, to use 2 it. It's one of the options that you have. So 3 it's been referenced in that publication right 4 there. 5 It's not -- this is not a complex crash 6 that we're using it to analyze. It's about as 7 simple as a crash can get. 8 One vehicle's sitting still and gets 9 almost perfectly rear ended by another vehicle. 10 And all the program's got to do is use -- we -- we 11 tell it what the two vehicles are. 12 And then we tell it the strength of the 13 two vehicles. In case of the one vehicle it knew 14 the strength, and the other we told it the 15 strength. 16 And then we -- we changed the relaxation 17 or the coefficient of restitution until the data 18 matches the -- the crash, the pulse that was 19 recorded by the truck as far as the -- the 20 beginning and ending speed. 21 That's -- that's like a 3-foot give me 22 putt for this program. It's -- it's designed to do 23 a whole lot more than that. 24 This is -- this is the fundamental 25 purpose of the -- of the engineering dynamics was</p>

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<p style="text-align: right;">Page 170</p> <p>1 to look at crush in collisions and calculate this 2 stuff. 3 And it goes back 30 years. This -- what 4 we're using, though, is just the latest iteration 5 of it. 6 So I kind of -- and I got a calculator, 7 too. You know, it works pretty good as well. It's 8 just a calculation tool, that's all it is for this 9 case. 10 BY MR. HILL: 11 Q You would agree that it's obviously -- 12 its results are dependent upon those variables you 13 just mentioned? 14 A Within reason, yes. But the vagaries of 15 the -- of the variables, you know, that are -- are 16 very, very minor. 17 In other words, we use two calculation 18 methodologies that are very far apart. We got 19 2.1 feet -- less feet crush and 1 and 2.3 less feet 20 crush in the other, that's a -- that's a really 21 small window. 22 You know, if -- if it had been a large 23 window, we would have -- and maybe looked going 24 further, but we got the -- we got a very, very 25 tight result using two independent methodologies</p>	<p style="text-align: right;">Page 172</p> <p>1 perfect, but it's -- it's a tool and can be used. 2 Sure. No problem. 3 Q But you, in your opinion, rate an actual 4 crash test higher than the simulations or 5 calculations with regard to reliability in 6 predicting what would happen in a hypothetical 7 crash? 8 A Well, it depends on who did it and how 9 they did it. I mean, very well -- you know, it 10 could be, it could not be, we would have to see it. 11 You know, if -- in a perfect world, I 12 would -- you know, I would like to -- I would 13 choose the crash test if it were done as well as it 14 should be done. I would tend to choose it, but, 15 you know, we'd have to see it first. 16 Q Have you done actual crash testing of 17 vehicles in your work in the past? 18 A Yes. 19 Q And in those cases when you did an actual 20 crash test, did you also do like crush calculations 21 like we did in this case or -- and/or any 22 simulations or did you just rely upon the actual 23 physical crash test? 24 A All different ways. But normally we do 25 calculations so that we can set up the crash test,</p>
<p style="text-align: right;">Page 171</p> <p>1 reasonably and -- 2 Q I'm sorry, are you finished? 3 A And we're good with that. 4 Q A third methodology you could have 5 employed would have been to actually develop a 6 crash test involving an exemplar 2016 F250 and a 7 2008 Ford Escape. Do you agree with that? 8 A I mean, that's possible, yes, sir. 9 Q Yeah. And obviously, that would be a 10 real, real crash test that would not involve or be 11 subject to input variables or other variables that 12 the program and the calculations can't account? 13 A I can't agree with the last part of it. 14 It's just a different way. You don't -- you don't 15 blame an orange tree for not bearing apples. It's 16 an orange tree. But yes, that is another thing 17 that could be used. 18 And if someone wanted to do that now, 19 there would still be variables that had to be 20 accounted for every time everyone does a crash test 21 that some guy says the humidity was different that 22 day or something. 23 I'm not saying humidity matters, it's 24 just, you know, there's always things that, you 25 know, enter into that, too. It's -- it's not</p>	<p style="text-align: right;">Page 173</p> <p>1 you know, so. Or sometimes do a crash test just 2 to -- just to evaluate one part of the crash. 3 So, you know, the simulation -- you know, 4 a crash test is just to explain some thing or to 5 investigate one thing and then the calculations are 6 still where the answers come. So there's all 7 different versions of it. 8 THE WITNESS: If you get to a good 9 stopping point, and I can wait, I would like to 10 take a break. 11 MR. HILL: All right. You can take a 12 break whenever you like and hopefully we're getting 13 towards the end. 14 THE WITNESS: Okay. 15 MR. HILL: Let's take a break. 16 THE WITNESS: Thank you very much. 17 VIDEO TECHNICIAN: The time is 3:10. We 18 are off the record. 19 (Recess taken.) 20 VIDEO TECHNICIAN: The time is 3:32. We 21 are back on the record. 22 MR. HILL: Thank you. 23 BY MR. HILL: 24 Q A couple of clarifying questions 25 regarding the HVE simulation.</p>

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<p style="text-align: right;">Page 174</p> <p>1 When you said that the initial -- and I</p> <p>2 think you said relaxation coefficient is maybe the</p> <p>3 term used by HVE?</p> <p>4 A Yeah, they have a relaxation link in</p> <p>5 there that -- that manipulates the coefficient of</p> <p>6 restitution. So that's how you get to it in this</p> <p>7 particular module.</p> <p>8 Q Right. So you testified that the initial</p> <p>9 relaxation values did not match up with the known</p> <p>10 impact and -- you know, entry and exit velocities.</p> <p>11 Is that not --</p> <p>12 MS. CANNELLA: Entry and exit, what did</p> <p>13 you say?</p> <p>14 BY MR. HILL:</p> <p>15 Q The velocities --</p> <p>16 MS. CANNELLA: Velocity.</p> <p>17 BY MR. HILL:</p> <p>18 Q -- or whatever the appropriate term is.</p> <p>19 A Right, it didn't -- you know, it -- it</p> <p>20 might have, but it didn't give the proper exit</p> <p>21 velocity that we -- or the delta-V that we were</p> <p>22 trying to use to represent this particular accident</p> <p>23 because it was accident-related data.</p> <p>24 And it was no surprise it didn't. We</p> <p>25 knew that it would be just a fluke if it did.</p>	<p style="text-align: right;">Page 176</p> <p>1 one millionth of the expertise you have in this,</p> <p>2 but -- so you're not inputting into HVE relaxation</p> <p>3 or coefficient of stiffness or restitution?</p> <p>4 A Restitution. Coefficient of restitution.</p> <p>5 Q Yeah, you're not inputting that for each</p> <p>6 individual involved in the simulation? The</p> <p>7 simulation is generating a combined, for lack of a</p> <p>8 better word, coefficient of restitution for the</p> <p>9 accident and then using that in the simulation?</p> <p>10 A That was almost but not quite. It needs</p> <p>11 a value to run the simulated crash.</p> <p>12 So it has a value it'll typically start</p> <p>13 with, but if we know better or if we know an answer</p> <p>14 at the -- at the -- after the crash, we can --</p> <p>15 that's a tool we can use to get the proper input</p> <p>16 and the proper exit speeds.</p> <p>17 And it's called tuning. We're just</p> <p>18 tuning it to match the data that we -- we believe</p> <p>19 was measured and was reasonably measured and -- and</p> <p>20 we're using it for our particular analysis.</p> <p>21 Q Okay. Tuning is just to that one</p> <p>22 number --</p> <p>23 A Yes.</p> <p>24 Q -- that one coefficient of restitution</p> <p>25 that represents the accident as a whole?</p>
<p style="text-align: right;">Page 175</p> <p>1 Q Sure. And the relaxation value for the</p> <p>2 Ford Escape that was used in the initial</p> <p>3 simulations, where did that come from?</p> <p>4 A There's not a value for the Ford Escape.</p> <p>5 It's an inter-vehicle, vehicle to vehicle. So it</p> <p>6 will change depending on where you hit on the</p> <p>7 vehicles. You can have the exact same two</p> <p>8 vehicles. Hit -- hit a little bit differently,</p> <p>9 you'll get a different value.</p> <p>10 So it just has a value when you turn the</p> <p>11 program on and it has a value that pops up. And</p> <p>12 then it's one of the things that we expect to have</p> <p>13 to modify. I don't remember what the -- what the</p> <p>14 value that pops up is. We call it the default</p> <p>15 value. But it's pretty close to what we had.</p> <p>16 Q Is the default value based upon the</p> <p>17 individual vehicles involved in the simulation or</p> <p>18 was it just the standard default value?</p> <p>19 A I -- my recollection is it's just a</p> <p>20 standard value that pops up. It's what the program</p> <p>21 starts with.</p> <p>22 Q Okay.</p> <p>23 A It's got to have something.</p> <p>24 Q Yeah. So just that so that I understand</p> <p>25 it, and I apologize for -- I'm not having one --</p>	<p style="text-align: right;">Page 177</p> <p>1 A Yes.</p> <p>2 Q And so, why did you have to go to Neptune</p> <p>3 Engineering to get the stiffness coefficient for</p> <p>4 the F250 -- go ahead.</p> <p>5 A Yeah, because that's an input. It needs</p> <p>6 to know a reasonable strength of the vehicles. It</p> <p>7 -- some vehicles like the Escape, it already had a</p> <p>8 strength in, but the F250 it didn't. And when I</p> <p>9 say strength, I mean, coefficient -- crush</p> <p>10 coefficients.</p> <p>11 So, therefore, we told it a reasonable</p> <p>12 value from Neptune Engineering to use.</p> <p>13 Q Right. So that there is a component of</p> <p>14 the crush coefficient of each vehicle that HVE</p> <p>15 uses?</p> <p>16 A Oh, absolutely. Yes, sir. Yes, sir.</p> <p>17 Q That was what was confusing me.</p> <p>18 MS. CANNELLA: I think we might --</p> <p>19 Mr. Hill, I'm sorry to interrupt you, but I think</p> <p>20 you guys might be getting your wires crossed on the</p> <p>21 terms, and I could be wrong, about the coefficient</p> <p>22 of restitution and the crush coefficient. They're</p> <p>23 different things, I think.</p> <p>24 A If -- I might have heard the question</p> <p>25 wrong.</p>

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<p style="text-align: right;">Page 178</p> <p>1 MS. CANNELLA: Okay.</p> <p>2 A So --</p> <p>3 MS. CANNELLA: I don't know.</p> <p>4 A Let's just -- let me make sure to listen</p> <p>5 to the question. I thank you. If we could try</p> <p>6 that last one again because I might have heard it</p> <p>7 wrong.</p> <p>8 MR. HILL: Well, that's something we need</p> <p>9 to clear up.</p> <p>10 Thank you, Tedra.</p> <p>11 BY MR. HILL:</p> <p>12 Q Is there a difference between crush</p> <p>13 stiffness coefficient and coefficient of</p> <p>14 restitution?</p> <p>15 A There absolutely is.</p> <p>16 Q Okay.</p> <p>17 A So the crush stiffness coefficients have</p> <p>18 to do with the inherent strength of the vehicle.</p> <p>19 And then the coefficient of restitution</p> <p>20 has to do with the rebound or somewhat -- or the --</p> <p>21 more or less a way -- the plasticity or elasticity</p> <p>22 of the vehicles as they combine and hit each other.</p> <p>23 So one is -- one is kind of the</p> <p>24 springiness and the other is the strength.</p> <p>25 Q So when we're talking about stiffness</p>	<p style="text-align: right;">Page 180</p> <p>1 Neptune?</p> <p>2 A (Nodding head.)</p> <p>3 Q And then the stiffness coefficient used</p> <p>4 for the Escape was contained within the database</p> <p>5 already or within the program for the rear?</p> <p>6 A Yes.</p> <p>7 Q Okay. And then the program then</p> <p>8 generated its own coefficient of restitution to</p> <p>9 cover the entire accident?</p> <p>10 A No. It had a value that was just in it</p> <p>11 by default.</p> <p>12 Q Okay.</p> <p>13 A Not -- not knowing about this crash at</p> <p>14 all.</p> <p>15 Q Okay.</p> <p>16 A And then we tuned it to match the known</p> <p>17 data in this crash.</p> <p>18 Q Right. And so, the only thing you tuned</p> <p>19 was that the default coefficient of restitution you</p> <p>20 didn't change the stiffness coefficients for the</p> <p>21 two vehicles?</p> <p>22 A Correct.</p> <p>23 Q That's what I'm just trying to clear up.</p> <p>24 A And it's good to get it cleared up.</p> <p>25 Q Yeah. This is not the simplest stuff, so</p>
<p style="text-align: right;">Page 179</p> <p>1 coefficients, we're talking about strength?</p> <p>2 A Yes.</p> <p>3 Q Okay. And what version of HVE did you</p> <p>4 use, do you know?</p> <p>5 A It's a -- it's a recent -- I think the</p> <p>6 purchase of this was last year, so it's a recent --</p> <p>7 if the output doesn't tell it to us on top, I don't</p> <p>8 know off the top of my head. Let me look and see.</p> <p>9 Q 17.00.</p> <p>10 A That looks right.</p> <p>11 Q And that's from 2021?</p> <p>12 A Yes, sir.</p> <p>13 Q All right. And are there any new</p> <p>14 versions of it come out since 2021 that you're</p> <p>15 aware of?</p> <p>16 A Not that I'm aware of.</p> <p>17 Q Okay. And are you saying that there was</p> <p>18 no like database of stiffness coefficients for a</p> <p>19 2016 F250 contained within the HVE database?</p> <p>20 A We didn't find one when we looked, no.</p> <p>21 Q Okay. When you -- so you inputted the</p> <p>22 one you got from Neptune. And was that stiffness</p> <p>23 coefficient specific to any side of the F250?</p> <p>24 A It -- it was a frontal, yes.</p> <p>25 Q Okay. So you used the frontal one from</p>	<p style="text-align: right;">Page 181</p> <p>1 I appreciate your helping me.</p> <p>2 Now, does the -- does the center of</p> <p>3 gravity play any role? Is that something you have</p> <p>4 to input for each vehicle?</p> <p>5 A The center of gravity is input and it</p> <p>6 plays a very minor role. As long as you're even</p> <p>7 reasonably close, it -- it doesn't have an effect.</p> <p>8 Now, in this particular crash. In</p> <p>9 others, it can. Let's say you've got really an</p> <p>10 angled crash way off and it went in.</p> <p>11 So in this case it is put in and then</p> <p>12 it's -- it's left where it is in the -- in the</p> <p>13 stock vehicles.</p> <p>14 Q Okay. So -- so when you say it -- it is</p> <p>15 put in, is it put in by you, the user?</p> <p>16 A Yes, based on those weights or the specs</p> <p>17 that you have that we looked at earlier, that's --</p> <p>18 the CG is determined by those weights and its</p> <p>19 location and that's what's in the program after we</p> <p>20 put it in.</p> <p>21 Q Right. And that's -- that's kind of my</p> <p>22 question, because in the HVE simulation the Escape</p> <p>23 had a distribution of 60.6 percent to the front and</p> <p>24 39.4 percent to the rear.</p> <p>25 Is that something that HVE automatically</p>

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<p style="text-align: right;">Page 182</p> <p>1 input or is that something that you guys input?</p> <p>2 A I'd have to go back and look on this</p> <p>3 particular run. You can put occupants in and then</p> <p>4 it'll make the adjustments which is fine.</p> <p>5 Sometimes we put it in ahead of time.</p> <p>6 With those numbers you're telling me, it</p> <p>7 looks like we were accounting for occupants near --</p> <p>8 near the front wheels and the rear wheels.</p> <p>9 So my memory isn't perfect on that, but</p> <p>10 you -- but if -- even if we left it at the original</p> <p>11 57/43, it would not change the answer in this</p> <p>12 particular case.</p> <p>13 But it does look like -- the numbers</p> <p>14 being a little bit different, it looks like that --</p> <p>15 that either we or the program actually put the</p> <p>16 people in the front seat. So it -- you have a</p> <p>17 little more weight on the front.</p> <p>18 Q And so that 3 percent extra you would</p> <p>19 attribute to the front seat occupants?</p> <p>20 A Yes, because they're -- they're sitting</p> <p>21 closer to the front wheel so it adds a little bit</p> <p>22 of weight towards the front.</p> <p>23 Q Right. And how did you determine the</p> <p>24 weight of the front seat occupants? Did you have</p> <p>25 medical records or something from them or what?</p>	<p style="text-align: right;">Page 184</p> <p>1 A Well, the chainsaw and the storage box</p> <p>2 are just internet searches for those objects. And</p> <p>3 then the tools is an estimate by -- by me. You got</p> <p>4 a storage box, some tools in it and we needed a</p> <p>5 weight. I chose a hundred pounds based on all the</p> <p>6 tool boxes I have.</p> <p>7 Q Okay. And with regard to the Escape, the</p> <p>8 only thing that wasn't included would have been the</p> <p>9 spare tire and rim in the weight calculation?</p> <p>10 A No, it was in there, but it was</p> <p>11 probably -- I can't tell you it was at the back or</p> <p>12 in the middle seat or the front seat. It could</p> <p>13 have been moved around, but it -- it was in there.</p> <p>14 Q It was in there, you just don't know</p> <p>15 which wheel it would have registered on more than</p> <p>16 the -- the others?</p> <p>17 A Right. Yes, sir.</p> <p>18 Q I understand.</p> <p>19 The fact that the increase of that</p> <p>20 3 percent of weight distribution to the front in</p> <p>21 the Escape in your model, which by my calculations</p> <p>22 would have moved the center of gravity 4 inches</p> <p>23 forward, does that have any impact on your</p> <p>24 simulation in your opinion?</p> <p>25 A Not in this case, it will not. I mean,</p>
<p style="text-align: right;">Page 183</p> <p>1 A It's included in our -- in our materials</p> <p>2 here. Take a minute to find it, but we do have</p> <p>3 reference weights for all the people that were in</p> <p>4 the vehicle, either with their driver's license,</p> <p>5 where they often get it. Medical records is where</p> <p>6 we often get it. Or even in the depositions.</p> <p>7 But if we -- if you go look, there's a</p> <p>8 sheet in here that tallies and -- and has the</p> <p>9 references behind it. I think I have a tab called</p> <p>10 Weights. Yeah, I do.</p> <p>11 I have a weight sheet and behind the</p> <p>12 weight sheet is the weights of the vehicles, Hunter</p> <p>13 Elliott's weight. The Ford Escape, we have its</p> <p>14 weight. We have the weight of Santana Bryson and</p> <p>15 Joshua Bryson from their medical records. And of</p> <p>16 course, Cohen Bryson.</p> <p>17 So that's where we got them from.</p> <p>18 Medical records of all the people.</p> <p>19 Q Is this what I put on the screen, what</p> <p>20 you're referring to?</p> <p>21 A Yes, sir, that's the Result and behind it</p> <p>22 should be the medical records that we used.</p> <p>23 Q Right. And the weights for the F250, you</p> <p>24 have weights for the chainsaw, storage box and</p> <p>25 tools. How did you come up with those weights?</p>	<p style="text-align: right;">Page 185</p> <p>1 it's -- it just won't have -- it just won't have an</p> <p>2 effect.</p> <p>3 I mean, if you're talking about, you</p> <p>4 know, .01 something somewhere, which is not an</p> <p>5 effect in my mind, but the -- the final answer is</p> <p>6 going to be the -- the same answer.</p> <p>7 Q So the exact location of the CG is not</p> <p>8 important to the HVE model in this case?</p> <p>9 A A reasonable CG location is important,</p> <p>10 but moving it forward a few inches is not going to</p> <p>11 change anything in this case, no, sir.</p> <p>12 Q All right. When you adjusted the -- the</p> <p>13 weights -- because I guess it pulls up a generic</p> <p>14 curb weight for the vehicle. Once you've input the</p> <p>15 vehicle, then you have to adjust it to add for the</p> <p>16 cargo and the people? Is that how it --</p> <p>17 A Yes. Yes.</p> <p>18 Q Okay. And so when you adjusted those</p> <p>19 weights, do you know whether you're in total mass</p> <p>20 mode or spring mass mode?</p> <p>21 A I think it's in spring mass mode. But</p> <p>22 when you say mass mode, it's a spring mass, but</p> <p>23 where -- where -- it doesn't matter whether we</p> <p>24 change the total weight of the vehicle or we add</p> <p>25 the occupants. They are a part of the sprung mass,</p>

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<p style="text-align: right;">Page 186</p> <p>1 so that's where the program is going to put it.</p> <p>2 Q So it doesn't make any difference what</p> <p>3 mode you're in, it's going to put it in the sprung</p> <p>4 mass -- enter the sprung mass is what you're</p> <p>5 saying?</p> <p>6 A The way we would view it, yes. I'm not</p> <p>7 saying somebody can't do it a different way, but,</p> <p>8 you know, we're -- we're looking at the -- at the</p> <p>9 sprung mass of the vehicle.</p> <p>10 You know, it doesn't -- just for what</p> <p>11 it's worth, it's -- there are a lot of ways you can</p> <p>12 hit a putt and have it go in the hole. Whether it</p> <p>13 goes in the right side or left side, that's what</p> <p>14 we're looking at here.</p> <p>15 We're -- there are things that definitely</p> <p>16 matter. The speeds definitely matter. The overall</p> <p>17 weights, you know, within reason, you know, matter.</p> <p>18 But we're not trying to say it's an</p> <p>19 exact, precise, 100 percent answer. We're trying</p> <p>20 to look at two independent ways to get it. We get</p> <p>21 the same answer for both. It would have been less</p> <p>22 -- 2 feet less crush or more.</p> <p>23 But we can play with it and the answer</p> <p>24 might be 2.2 or 2.1 or 2.3, but it's -- what we're</p> <p>25 -- just to be clear, these things are considered</p>	<p style="text-align: right;">Page 188</p> <p>1 run?</p> <p>2 A That's my recollection, yes, sir.</p> <p>3 Q But it's your understanding -- since we</p> <p>4 don't have the Neptune for the other side, it's</p> <p>5 your understanding that the program did consider</p> <p>6 the stiffness for the other three sides of the</p> <p>7 F250?</p> <p>8 A Right.</p> <p>9 Q Okay.</p> <p>10 A It already had them loaded for the -- for</p> <p>11 the Escape. If it wanted them, they could use</p> <p>12 them, but I don't think it used them.</p> <p>13 Q Are there sources for the stiffness</p> <p>14 coefficient of the F250 other than like Neptune</p> <p>15 Engineering?</p> <p>16 I mean, isn't there NHTSA crash data and</p> <p>17 other sources that you could use to determine those</p> <p>18 -- those coefficients?</p> <p>19 A In a sense, but Nep -- the government</p> <p>20 crash test, NHTSA, that's what Neptune uses. The</p> <p>21 government does not give you the stiffness values,</p> <p>22 you have to calculate them. We can calculate them.</p> <p>23 We prefer to use Neptune for consistency.</p> <p>24 Everybody else in the industry can get to it. And</p> <p>25 in my mind it's generally accepted.</p>
<p style="text-align: right;">Page 187</p> <p>1 when we run the program, but we don't -- it's not a</p> <p>2 critical factor.</p> <p>3 Q Going back real quick to the stiffness</p> <p>4 coefficient. And you've already said you used the</p> <p>5 input -- the front stiffness coefficient for the</p> <p>6 F250 from Neptune Engineering. And the program</p> <p>7 already had the rear stiffness coefficient for the</p> <p>8 Escape.</p> <p>9 Did the program consider the stiffness</p> <p>10 coefficients for any other side of any of the</p> <p>11 vehicle?</p> <p>12 A No.</p> <p>13 Q Okay. Is that something that the program</p> <p>14 allowed you to input as well?</p> <p>15 A Okay, yes, the program has those values</p> <p>16 in it already. If it wants them, it can use them</p> <p>17 for the Escape. For the truck, we only gave it the</p> <p>18 frontals.</p> <p>19 So if it wanted -- if it wanted something</p> <p>20 beside, it would have to do a -- it would have to</p> <p>21 do a ratio off of that or something. But it -- it</p> <p>22 only required us to give it the frontals.</p> <p>23 Q So you're saying required meaning the</p> <p>24 occupant, the input, the other side, if you wanted</p> <p>25 to, but it wasn't required for the simulation to</p>	<p style="text-align: right;">Page 189</p> <p>1 I've known Mr. Neptune and his business</p> <p>2 and -- for 30 years. Hence, I'm very comfortable</p> <p>3 with -- with his process. It's -- it's a</p> <p>4 standardized process.</p> <p>5 There -- there are other clearinghouses</p> <p>6 you could probably go to at this point in time. I</p> <p>7 don't use any of the others. If I don't have -- if</p> <p>8 Mr. Neptune doesn't have what I need we recalculate</p> <p>9 it ourselves.</p> <p>10 Q All right. Speaking of that, were you</p> <p>11 provided crash testing that was performed by Ford</p> <p>12 in this case?</p> <p>13 A No.</p> <p>14 Q Okay.</p> <p>15 A Or if I did, I didn't see it.</p> <p>16 Q So you're not relying upon any crash</p> <p>17 testing performed by Ford in your -- to give your</p> <p>18 opinions in this case?</p> <p>19 A Well, ultimately, the -- the NHTSA test,</p> <p>20 sometimes I -- so if -- if we take that out, I've</p> <p>21 gotten no other crash tests that I'm looking at by</p> <p>22 Ford.</p> <p>23 Q All right. And you didn't use the NHTSA</p> <p>24 crash testing of Ford to calculate the stiffness</p> <p>25 coefficient in this case, you -- you used the</p>

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<p style="text-align: right;">Page 190</p> <p>1 Neptune Engineering number?</p> <p>2 A Yes. For the F250, yes. And Neptune</p> <p>3 used the NHTSA data.</p> <p>4 Q Just to cover everything with HVE so I</p> <p>5 don't get yelled at by my people. What environment</p> <p>6 was used for the collision?</p> <p>7 A The HVE environment. There isn't -- in</p> <p>8 our case we're just using a flat level plane.</p> <p>9 Q Right.</p> <p>10 A So we're -- we're really interested in</p> <p>11 the crush phase which lasts, you know, a quarter</p> <p>12 second. After that, nothing. We're not interested</p> <p>13 in that because we're interested in the crush.</p> <p>14 Q Understood. Was the coefficient of</p> <p>15 friction of the roadway involved in the simulation?</p> <p>16 A It's probably in there, but it's -- you</p> <p>17 know, it's -- it's irrelevant.</p> <p>18 Q It's going to be a default value or</p> <p>19 something that the program generates itself?</p> <p>20 A Yes.</p> <p>21 Q And you didn't measure the coefficient of</p> <p>22 the roadway and provide that as input in the</p> <p>23 simulation?</p> <p>24 A No.</p> <p>25 Q In the crush calculations that you did,</p>	<p style="text-align: right;">Page 192</p> <p>1 Q Yeah, I can't give you the exact number,</p> <p>2 I'm sorry.</p> <p>3 A Yeah, we'll get it. I'm just kind of</p> <p>4 slow at flipping pages sometimes.</p> <p>5 It used a .11. So HVE used a .11. In</p> <p>6 our calculations we used a 0.1 for the</p> <p>7 bumper-to-bumper hit which are going to be, of</p> <p>8 course, different from the accident because you had</p> <p>9 a bumper to tailgate hit.</p> <p>10 So we -- we didn't use -- we used .1,</p> <p>11 which was my judgment, and HVE we had to use a .11</p> <p>12 to get it to match.</p> <p>13 Q What did you just reference to find the</p> <p>14 .11 coefficient for the HVE?</p> <p>15 A You asked for the HVE reports over the</p> <p>16 weekend and they were sent to you, so I'm looking</p> <p>17 at the inter-vehicle collision data page.</p> <p>18 Inter-vehicle collision data page.</p> <p>19 Q And are you pointing out from .113 where</p> <p>20 it says "Restitution Coefficient" on the right</p> <p>21 side --</p> <p>22 A Yes.</p> <p>23 Q -- here?</p> <p>24 All right. And this is just reflecting</p> <p>25 the final, I guess, say input that you guys put in</p>
<p style="text-align: right;">Page 191</p> <p>1 we talked about your coefficient of restitution</p> <p>2 that you used for those calculations, and I believe</p> <p>3 you testified it was your best estimate of an</p> <p>4 appropriate coefficient of restitution of 1.1?</p> <p>5 A 0.1.</p> <p>6 Q I'm sorry?</p> <p>7 A 0.1.</p> <p>8 Q Yeah, I'm sorry, 0.1.</p> <p>9 Did you ever tune the HVE simulation</p> <p>10 using that same coefficient of restitution you can</p> <p>11 use in the crush analysis?</p> <p>12 A I'm sure. We tried .1 and we didn't get</p> <p>13 the -- the -- the data that had been measured by</p> <p>14 the truck when we did that. So the .1's a pretty</p> <p>15 easy number put in.</p> <p>16 So .1 or something essentially .1, but,</p> <p>17 you know, it didn't -- didn't match the input and</p> <p>18 output data.</p> <p>19 Q Did you in performing your crush</p> <p>20 calculations ever use the 1.4, that approximate</p> <p>21 number of coefficient of restitution, that was used</p> <p>22 in the HVE simulation?</p> <p>23 A No. HVE didn't use .14. Point 1 --</p> <p>24 well, let me check that. I might be wrong. Thank</p> <p>25 you for letting me clarify.</p>	<p style="text-align: right;">Page 193</p> <p>1 as the coefficient that you actually use the input</p> <p>2 and output speed values that you observed from the</p> <p>3 download?</p> <p>4 A Yes, those are -- those are input and</p> <p>5 output speeds we were targeting, and the .11 is</p> <p>6 what hit the targets.</p> <p>7 Q Gotcha.</p> <p>8 And you don't know what that started out</p> <p>9 as from a default perspective?</p> <p>10 A I don't remember, no, sir.</p> <p>11 Q And you don't remember how many</p> <p>12 variations or tuning to that you guys had to do</p> <p>13 before you got the output that you expected?</p> <p>14 A No. But not -- not that we expected,</p> <p>15 that we targeted. We -- we targeted specific</p> <p>16 values from the download.</p> <p>17 Q Yeah, you say targeted. It's -- you're</p> <p>18 just trying to match the download?</p> <p>19 A Yes.</p> <p>20 Q You're not targeting something out of the</p> <p>21 blue?</p> <p>22 A Correct. Thank you.</p> <p>23 Q In your inspections of the vehicle by</p> <p>24 your team, did you guys ever remove the seat covers</p> <p>25 from the front seats of the Escape?</p>

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<p>1 A Talking about the little fabric covers?</p> <p>2 Yes, I think we did.</p> <p>3 Q And what was the purpose of doing that?</p> <p>4 A Oh, when we were scanning it, I think --</p> <p>5 I thought it would show up better or something like</p> <p>6 that. It didn't -- it wasn't really part of an</p> <p>7 inspection of the seat, it was just to, you know,</p> <p>8 work on appearance. Or photo.</p> <p>9 Q Make the scan more accurate; is that --</p> <p>10 A Yeah, like a color variation. I don't</p> <p>11 remember the color of them as I sit here, but I do</p> <p>12 remember looking at that. And maybe they were</p> <p>13 crumpled up in some way, but I do remember</p> <p>14 adjusting that.</p> <p>15 I think we did -- I think I kind of</p> <p>16 removed them, but it's not a critical point. We</p> <p>17 can look at the photo some, but I think we did.</p> <p>18 Q Did your team uncover any evidence that</p> <p>19 the driver's seat was impacted by anything?</p> <p>20 A Oh, I wasn't looking for that.</p> <p>21 Q Okay. And again, I think we've discussed</p> <p>22 that you don't intend to give any opinions as to</p> <p>23 whether the child impacted the front driver seat?</p> <p>24 A That's beyond my area of expertise.</p> <p>25 Q Now, I think you've acknowledged that</p>	<p>1 the way over the top of a vehicle.</p> <p>2 But as far as passenger cars, which we're</p> <p>3 talking about here, I don't know off the top of my</p> <p>4 head. I'm not agreeing or disagreeing, I just</p> <p>5 don't know.</p> <p>6 It's -- you know, maybe at extreme speeds</p> <p>7 or something like that, but -- but I don't have any</p> <p>8 that I'm thinking about as I sit here.</p> <p>9 Q And how would you define "extreme</p> <p>10 speeds"?</p> <p>11 A We -- we've seen hundred mile per hour</p> <p>12 collisions. That's extreme. I wouldn't think of</p> <p>13 an exact number. I was just thinking of something</p> <p>14 that's just...</p> <p>15 Q Why is there any threshold speed where</p> <p>16 you would expect there to be override and intrusion</p> <p>17 into the occupant space? Is there a way for you to</p> <p>18 put a number on that?</p> <p>19 A No. It -- it depends on the accident.</p> <p>20 I'm not trying to judge cars as a -- you know, as a</p> <p>21 group, I'm looking -- I look at specific accidents.</p> <p>22 But you ask me have I seen it, I don't</p> <p>23 remember any, but, you know, we do -- we do see a</p> <p>24 fair number of hundred-mile-per-hour vehicles out</p> <p>25 there. And, you know -- you know, that's where I</p>
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<p>1 there can be intrusion into the occupant space in</p> <p>2 collisions that don't involve lifted vehicles; is</p> <p>3 that a fair statement?</p> <p>4 A I don't think so, but maybe we can</p> <p>5 clarify.</p> <p>6 Q Okay. So you -- when you say you don't</p> <p>7 think so, do you think it's impossible for there to</p> <p>8 be intrusion into the passenger occupant space in a</p> <p>9 collision that does not involve lifted vehicles?</p> <p>10 A I didn't fully follow the question. I --</p> <p>11 I think the answer, though, is, yes, a nonlifted</p> <p>12 vehicle can sometimes intrude the occupant space</p> <p>13 of -- of a -- the bullet vehicle that's nonlifted</p> <p>14 can sometimes include the occupant space of a</p> <p>15 target vehicle.</p> <p>16 Q That's all. Thank you for clarifying my</p> <p>17 question, yeah.</p> <p>18 A Thank you.</p> <p>19 Q Have you ever been involved in a case</p> <p>20 where there is a rear-end collision with nonlift --</p> <p>21 involving -- you know, neither vehicle was lifted</p> <p>22 where you observed intrusion into the occupant</p> <p>23 space?</p> <p>24 A The ones I think of are commercial motor</p> <p>25 vehicles. I mean, I've had them literally go all</p>	<p>1 would start looking.</p> <p>2 Q Right. So you acknowledge it's possible,</p> <p>3 you just can't remember a specific situation that</p> <p>4 -- that you're involved in as you sit here today?</p> <p>5 A Yes, sir. And my apologies, I'm not here</p> <p>6 today to remember other accidents and I have a</p> <p>7 terrible memory of other accidents where I'm this</p> <p>8 focused on -- on a particular problem.</p> <p>9 Q Sure. I guess on this same line, would</p> <p>10 you agree that there are accidents where the speed</p> <p>11 can be so severe that bumper height is not really</p> <p>12 relevant to whether a person can be injured in the</p> <p>13 accident?</p> <p>14 MS. CANNELLA: Object to that question as</p> <p>15 vague and an incomplete hypothetical.</p> <p>16 A Bumper height would still be important.</p> <p>17 Bumper height could in -- in many accidents could</p> <p>18 change the outcome.</p> <p>19 So I -- as a -- as a general statement,</p> <p>20 I -- I can't agree or disagree, we'd have to look</p> <p>21 at specific events.</p> <p>22 BY MR. HILL:</p> <p>23 Q I understand.</p> <p>24 So you would have to be presented with a</p> <p>25 specific scenario in order to give an answer to</p>

50 (Pages 194 - 197)

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<p style="text-align: right;">Page 198</p> <p>1 that question?</p> <p>2 A The way I heard it. I -- I don't want to</p> <p>3 give a generalization. I'd rather talk about</p> <p>4 specifics.</p> <p>5 Q Give me one second here.</p> <p>6 One of the items in the material you</p> <p>7 provided to us is Georgia Code Section 40-8-6.</p> <p>8 Did you rely upon that code section in</p> <p>9 formulating any of your opinions in this case?</p> <p>10 A I don't believe I did. It's a piece of</p> <p>11 background information.</p> <p>12 And if the question is, was the vehicle</p> <p>13 lifted more than 2 inches, yes. I think that's the</p> <p>14 code you were referring to.</p> <p>15 But it doesn't affect my opinion that if</p> <p>16 the vehicle hadn't been lifted, you know, the --</p> <p>17 the crush would have been less and all of that.</p> <p>18 It's just a piece of background</p> <p>19 information that I'm aware of if -- if you want to</p> <p>20 compare it to the 2 inches, but I don't have a --</p> <p>21 it's not there for me to give an opinion off of.</p> <p>22 Q And that's what I meant. You don't plan</p> <p>23 to give any opinions on whether Mr. Elliott</p> <p>24 violated that statute or not in this case?</p> <p>25 A Only -- only if I'm asked was the vehicle</p>	<p style="text-align: right;">Page 200</p> <p>1 question, but maybe you can help point me in the</p> <p>2 right direction.</p> <p>3 But are there any topics or areas that</p> <p>4 you plan to give testimony on that we haven't</p> <p>5 covered today? What am I missing?</p> <p>6 MS. CANNELLA: Object to the form of the</p> <p>7 question as vague, but you can answer.</p> <p>8 A In my mind, you're not missing anything.</p> <p>9 We have the -- the -- you know, the support, which</p> <p>10 you've gone through in the drawings. And then the</p> <p>11 calculations that -- and we've talked about the</p> <p>12 heights and the intrusion.</p> <p>13 So I believe -- I believe we have touched</p> <p>14 on all of the subjects. And you've been presented</p> <p>15 with the file materials.</p> <p>16 So when I'm sitting here, I'm not</p> <p>17 thinking about anything that I'm waiting on you to</p> <p>18 ask me about. If I did, I would tell you.</p> <p>19 BY MR. HILL:</p> <p>20 Q Well, that's why I ask the question. I</p> <p>21 know it's a bad question and that was a valid</p> <p>22 objection, but I'll subscribe to have you point me</p> <p>23 to something that I'll miss that's important to</p> <p>24 your opinions.</p> <p>25 MR. HILL: So let's take just a quick</p>
<p style="text-align: right;">Page 199</p> <p>1 lifted more than 2 inches, I will say, yes, but I'm</p> <p>2 -- so I -- I have data that can help, but I'm not</p> <p>3 here to say whether he violated it or not.</p> <p>4 But he -- if -- if -- if the -- if the</p> <p>5 hypothetical or if the ques- -- I can't use that</p> <p>6 word because I don't know what it means.</p> <p>7 If the question is was it lifted more</p> <p>8 than 2 inches, the answer is yes. But if the</p> <p>9 standard is 2 inches, then he violated the</p> <p>10 standard.</p> <p>11 But I'm not here to say what the standard</p> <p>12 for passenger cars are specifically. I'm just --</p> <p>13 it's in my file and I'm aware of it.</p> <p>14 Q Okay. You don't know how that statute's</p> <p>15 interpreted, what it's -- you know, what the</p> <p>16 baseline for that statute is, any of those that you</p> <p>17 haven't looked into that issue?</p> <p>18 A No, sir, it's a piece of data for me.</p> <p>19 Q Okay.</p> <p>20 MR. HILL: All right. Let's take just</p> <p>21 another five-minute break and make sure I haven't</p> <p>22 missed anything.</p> <p>23 BY MR. HILL:</p> <p>24 Q If I can ask you this question, it might</p> <p>25 help, but are there -- I know this is a difficult</p>	<p style="text-align: right;">Page 201</p> <p>1 10-minute break and make sure I've covered</p> <p>2 everything and then we can be done.</p> <p>3 THE WITNESS: See you in five minutes.</p> <p>4 Thank you.</p> <p>5 VIDEO TECHNICIAN: The time is 4:07.</p> <p>6 We're off the record.</p> <p>7 (Recess taken.)</p> <p>8 VIDEO TECHNICIAN: The time is 4:22. We</p> <p>9 are back on the record.</p> <p>10 MR. HILL: Thanks.</p> <p>11 BY MR. HILL:</p> <p>12 Q Let me share my screen here. Just a few</p> <p>13 follow-up questions.</p> <p>14 What I just put on the screen is 1362</p> <p>15 through 1374. This is what I think we've</p> <p>16 identified as the support to your report. I'm not</p> <p>17 sure whether we attached this as an exhibit to the</p> <p>18 report.</p> <p>19 A You did. You labeled the support as an</p> <p>20 exhibit. I don't mind you doing it again, but I</p> <p>21 remember you saying --</p> <p>22 THE COURT REPORTER: I think it was No.</p> <p>23 7, support.</p> <p>24 MR. HILL: Okay. Thank you.</p> <p>25 BY MR. HILL:</p>

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<p style="text-align: right;">Page 202</p> <p>1 Q Now, if you open this page, you have some 2 handwriting there that says: "Exemplar scan raised 3 .04 inches to account for stock tire differences." 4 And I guess that's where you're 5 indicating that your exemplar placarded car size 6 were different than the placard tire size on the 7 subject F250? 8 A Yes. 9 Q And -- and you have accounted for that 10 .04 -- that .04 feet. Sorry, I think I said 11 inches. The .04 feet is what that meant, is that 12 the same height? 13 A Yes. 14 Q Okay. And you accounted for that in all 15 of your simulations, that difference in that 16 placarded tire size between a 2015 and a 2016 F250? 17 A Right. The simulations use the accident 18 truck stock tire size, not the exemplar. The 19 exemplar tire size wasn't -- wasn't used in a 20 simulation. 21 Q Well, so you're saying that the 22 simulation, the HVE simulation of a nonlifted 23 version of the 2016 F250 used the tire size on -- 24 that was on the subject vehicle at the time of the 25 crash?</p>	<p style="text-align: right;">Page 204</p> <p>1 Q Those momentum calculations have a 2 coefficient of restitution. And I'm trying to 3 match all of those up. And does this coefficient 4 of restitution on 3993 correlate with those other 5 two coefficients of restitutions I've just 6 mentioned? 7 And when I say "correlate," I don't mean 8 are they the exact value, I'm just saying are we 9 talking about the same thing. 10 A Actually, there's some differences there. 11 This coefficient of restitution is for a reasonable 12 value for the bumper-to-bumper collision as -- as I 13 calculated it. 14 Q Right. 15 A There's a value that was derived through 16 the use of the HVE program which is .11 or .118, 17 eventually the same -- essentially the same thing, 18 or .113, essentially the same as this. Both of 19 those have to do with a bumper-to-bumper crash 20 struck by the limited -- lifted. 21 But the other was an attempt to derive a 22 coefficient of restitution for the accident, but we 23 really don't need it at all because it's -- you 24 know, that accident is that accident. 25 In other words, we -- we see the crush</p>
<p style="text-align: right;">Page 203</p> <p>1 A No, that it came with. That it was 2 originally provided with. 3 Q Right. And that's what I mean, is 4 that -- and it was .04 feet taller, for lack of a 5 better word, than the tires that were on your 6 subject -- on your exemplar vehicle? 7 A Yes. 8 Q Okay. We're on the same page. 9 When you did the crush calculations, 10 which I put up here as 3992 through 3993, help me 11 understand, is -- there's a coefficient of 12 restitution on 3993. And that would correlate with 13 the overall coefficient of restitution for the 14 accident we've been discussing in the context of 15 the HVE simulation and other (inaudible), right? 16 MS. CANNELLA: Object to the form of the 17 question as vague. 18 MR. HILL: I don't know how I could make 19 it more specific. 20 MS. CANNELLA: Which -- which accident 21 are we talking about here? 22 MR. HILL: We're talking about his 23 simulation had a coefficient of restitution that 24 was used to make each simulation. 25 BY MR. HILL:</p>	<p style="text-align: right;">Page 205</p> <p>1 and everything from it. 2 But -- so that's how they correlate. 3 They're different accidents, but two of them, the 4 .1 and the .11 plus are -- are for the 5 bumper-to-bumper crash. 6 Q I understand. So -- and the momentum 7 calculation, the restitution value there is for the 8 actual crash? 9 A Didn't hear the question. 10 Q Okay. So I just put up the momentum 11 sheet. 12 A Yes. 13 Q 4000. And I think that's what you were 14 saying that that restitution value on this page 15 correlates with the actual accident? 16 A It's a -- yes, it's an attempt to get the 17 accident value for -- for the tailgate and all 18 that. 19 Q And is that restitution value, .148, is 20 that derived from these calculations on this page? 21 A Yes, it's -- in order to get the final 22 answers at the bottom. The V1 -- the -- the -- 23 yeah, it's -- it's part of the calculation. 24 It's -- it's used to -- to make the data 25 -- the 51 and the 17.92 and the 33.08 match the</p>

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<p style="text-align: right;">Page 206</p> <p>1 accident.</p> <p>2 Q Gotcha.</p> <p>3 So you can put in different values for</p> <p>4 that restitution to make it output and match the</p> <p>5 output you just mentioned on the bottom?</p> <p>6 A Yes.</p> <p>7 Q Okay. For these -- the crush analysis</p> <p>8 using the mathematics on 3992, are the stiffness</p> <p>9 coefficients of each vehicle a part of this</p> <p>10 calculation?</p> <p>11 A Yes.</p> <p>12 Q Okay. And I -- I figured the answer was</p> <p>13 yes. Where on these pages exactly do they factor</p> <p>14 in?</p> <p>15 A Well, the -- in the highlighted section</p> <p>16 in green at the top, the third -- I'm sorry, the</p> <p>17 second and third lines are the A and B values, the</p> <p>18 crush stiffness coefficients, for the F250 and the</p> <p>19 Escape respectively.</p> <p>20 And then down throughout the calculation,</p> <p>21 those are referenced as capital A's and capital B's</p> <p>22 with a standard set of calculations, if that</p> <p>23 answers your question.</p> <p>24 Q It does exactly. And the AA and AB</p> <p>25 stiffness coefficient, what side of the vehicle do</p>	<p style="text-align: right;">Page 208</p> <p>1 in the very middle under the word Stiffness</p> <p>2 Coefficients.</p> <p>3 It ran straight into a barrier. And then</p> <p>4 from the -- the damage they calculated it an A</p> <p>5 value and a B value right there.</p> <p>6 Q And that's what's highlighted?</p> <p>7 A Sir?</p> <p>8 Q And that's what's highlighted on this</p> <p>9 page?</p> <p>10 A I still couldn't understand you, I'm so</p> <p>11 sorry.</p> <p>12 Q Don't worry. It was a dumb question</p> <p>13 anyways. Glad you couldn't hear it.</p> <p>14 A Okay.</p> <p>15 THE WITNESS: I think he did say,</p> <p>16 Ms. Court Reporter, what you thought he said.</p> <p>17 BY MR. HILL:</p> <p>18 Q The values on this page 3992 for AB and</p> <p>19 BB stiffness coefficients for the Escape, are those</p> <p>20 the ones that were generated by HVE when you input</p> <p>21 that was the vehicle or where did you derive those</p> <p>22 numbers?</p> <p>23 A Those are from an SAE paper, Society of</p> <p>24 Automotive Engineers paper, that should be a few</p> <p>25 pages down from here.</p>
<p style="text-align: right;">Page 207</p> <p>1 they represent?</p> <p>2 A The AA is for the front of the F250. And</p> <p>3 the AB and BB are for the rear of the Ford Escape.</p> <p>4 Q Right. So explain again real quick</p> <p>5 what's -- if the AA and BA for the F250 both relate</p> <p>6 to the front of the F250, why is there two there?</p> <p>7 A It's the way strength is expressed.</p> <p>8 We have an A coefficient which has to do</p> <p>9 with the amount of force it takes to start doing</p> <p>10 damage on the vehicle.</p> <p>11 And the B coefficient helps assign energy</p> <p>12 or crush stiffness as the crush progresses</p> <p>13 throughout the vehicle.</p> <p>14 So the -- so the -- the depth of crush is</p> <p>15 looking at the B value to calculate energy or force</p> <p>16 which ultimately calculates energy.</p> <p>17 Q And how did you come up with these</p> <p>18 values, the AA and BA for the F250?</p> <p>19 A Well, there's a report right after this</p> <p>20 from Neptune Engineering where they used a</p> <p>21 government crash test.</p> <p>22 Yeah, that -- that's it. It's listed</p> <p>23 there.</p> <p>24 And it gives you the date on the vehicle.</p> <p>25 It was going 35 miles an hour on the front. That's</p>	<p style="text-align: right;">Page 209</p> <p>1 Right there.</p> <p>2 Q And that's 3998?</p> <p>3 A Yes. And the title of the paper will be</p> <p>4 the next page, I hope.</p> <p>5 Yes. It's -- yeah, so there's the SAE</p> <p>6 paper number in the upper right.</p> <p>7 Q All right. And again, that's why you've</p> <p>8 highlighted that. Is that the only use you've had</p> <p>9 for this appendix is the highlighted numbers?</p> <p>10 A Yes.</p> <p>11 Q Okay. And do those numbers match up the</p> <p>12 stiffness coefficients that were used in the HVE</p> <p>13 simulation?</p> <p>14 A They're not the same.</p> <p>15 Q And again, the numbers used in the HVE</p> <p>16 simulation were generated by the software because</p> <p>17 it had a database for a 2008 Escape?</p> <p>18 A Yes, when we used that model car it gave</p> <p>19 us AB values, so we used them as an alternative to</p> <p>20 these.</p> <p>21 Q And that's what I was trying to get to,</p> <p>22 is that you did use the same stiffness coefficients</p> <p>23 for the F250 in both the crush analysis and in the</p> <p>24 HVE simulation, but you had different stiffness of</p> <p>25 coefficients for the Escape as we've just talked</p>

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<p style="text-align: right;">Page 210</p> <p>1 about between the two analyses?</p> <p>2 A Yes.</p> <p>3 Q Okay. Does the HVE program allow you to</p> <p>4 input the values on this appendix 3998 as the</p> <p>5 stiffness coefficient instead of what's in the</p> <p>6 database?</p> <p>7 A Sure.</p> <p>8 Q And likewise, in you doing the crush</p> <p>9 analysis, you could have used the numbers generated</p> <p>10 by HVE instead of the numbers in this opinion?</p> <p>11 A Yes.</p> <p>12 Q Okay. Why did you not use the same</p> <p>13 numbers for the Escape in both analyses?</p> <p>14 A We were trying to produce a range of</p> <p>15 values. We were doing -- trying to do a very</p> <p>16 straightforward standard calculation that we do</p> <p>17 using, you know, math formulas. And then we were</p> <p>18 trying to do a more sophisticated computer</p> <p>19 simulation.</p> <p>20 And so we followed the -- you know, if we</p> <p>21 do it by hand, we don't pull values out of SAE when</p> <p>22 we -- I mean, out of engineering dynamics.</p> <p>23 If we use the engineering dynamics, we'd</p> <p>24 like to use the values they have in there.</p> <p>25 So it was a way to get a range. And the</p>	<p style="text-align: right;">Page 212</p> <p>1 And -- and as -- as you suggested,</p> <p>2 someone could -- could go about it in a different</p> <p>3 way.</p> <p>4 If we only had one of these methods, we'd</p> <p>5 probably be doing something like what you're</p> <p>6 talking about, but we had two independent methods</p> <p>7 and used basic, different fundamental data in the</p> <p>8 two methods, so -- and we got a range and we're --</p> <p>9 we're comfortable that the -- that that brackets</p> <p>10 the -- the reasonable range of answers.</p> <p>11 Q Is there any way for you to put a value</p> <p>12 on the potential for error in either -- either</p> <p>13 analysis?</p> <p>14 A Well, yes, but that would be a different</p> <p>15 technique that we didn't use. When you have</p> <p>16 multiple techniques, it's kind of like a VENN</p> <p>17 diagram, you're -- you're looking at the overlaps</p> <p>18 areas.</p> <p>19 So we use multi -- independent</p> <p>20 techniques. If you only had one technique, you</p> <p>21 know, then -- then you'd have to do -- or one</p> <p>22 calculation methodology, you'd have to use a</p> <p>23 different technique to do the ranges.</p> <p>24 But right now we have a range of 10</p> <p>25 percent that ranges from 2.1 to 2.3 in that -- in</p>
<p style="text-align: right;">Page 211</p> <p>1 range is really tight, 2.1 to 2.3 feet less crush.</p> <p>2 And we say more than 2 feet in the</p> <p>3 report. So it was just -- we -- we could do more</p> <p>4 work to -- you know, and put in more numbers, but</p> <p>5 it's not going to change the answer we got.</p> <p>6 Q So it was just a purposeful range of the</p> <p>7 parameters you used across the two analyses?</p> <p>8 A Yes.</p> <p>9 Q Okay. And is there in your opinion a way</p> <p>10 to determine the potential degree of error in</p> <p>11 either analysis? You know, lots of these analyses</p> <p>12 say it's within a .5 percent or 5 percent de --</p> <p>13 standard deviation in either direction.</p> <p>14 Is there a way to establish a standard of</p> <p>15 deviation in either of these analyses?</p> <p>16 A Sure. If one wanted to, one could --</p> <p>17 could do something along those lines. We -- we</p> <p>18 have effectively done it by using two independent</p> <p>19 methods. And we're looking at where those values</p> <p>20 overlap.</p> <p>21 If we did the ranges, then, obviously,</p> <p>22 they would -- they would overlap between them. And</p> <p>23 so we feel comfortable in this methodology for --</p> <p>24 for establishing a range. Other people could have</p> <p>25 other ways they want to do it.</p>	<p style="text-align: right;">Page 213</p> <p>1 the reduced crush.</p> <p>2 So, you know, we -- we've got a range of</p> <p>3 10 percent between 2.1 and 2.3 and we're -- we're</p> <p>4 comfortable with that.</p> <p>5 Q Understood. This is a page from the</p> <p>6 support document 1367. That is a graph of the</p> <p>7 simulated damage from the HVE simulation.</p> <p>8 HVE did not generate this document, this</p> <p>9 is something you generated separate from that</p> <p>10 software, correct?</p> <p>11 A The software gives the numbers, all we</p> <p>12 did is plot the numbers.</p> <p>13 Q Right. So the numbers from the software</p> <p>14 would be the numbers in blue?</p> <p>15 A Yes.</p> <p>16 Q All right. And you just plotted that on</p> <p>17 this. And then noted 2.1 in the red you generated</p> <p>18 that -- that's the difference between the two, but</p> <p>19 the red line is from your physical examination of</p> <p>20 the accident vehicle?</p> <p>21 A Yes.</p> <p>22 Q Okay. Why are the values zero on the</p> <p>23 ends on the blue line?</p> <p>24 A Because that's the way HVE does it.</p> <p>25 It's -- it's at the end, it says there's zero</p>

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<p style="text-align: right;">Page 214</p> <p>1 crush. It -- it's just -- it's just the way they 2 report it, that's all it is. 3 Because there's nothing to measure from 4 that far out on the vehicle. You know, where the 5 bumper -- if it's in front of the bumper, then it 6 measures to the bumper. It's just the way it's 7 reported. 8 But I'm not -- I'm not interested in 9 their reporting necessarily or the -- I am in their 10 answer. Their answer is the line -- at least 11 that's my representation of their answer. 12 So it -- you know, one could argue there 13 is crush over there and -- and I've got no problem 14 because you can see it, but way out on the ends 15 it's technically zero. 16 Q Now, when you created the blue line, you 17 used your own judgment as to where that would 18 actually -- how far that would actually crush in 19 even though technically HVE is going to give you a 20 value of zero? 21 A Well, no, it -- it also gives you a 22 graphical result -- I mean, a -- a 3D result you 23 can look at. 24 So you get a visualization of it. We 25 just simplified it down to a -- an elevation that</p>	<p style="text-align: right;">Page 216</p> <p>1 the truck pushed in with its bumper. 2 So we're comparing where the truck did 3 push the hatch to where the truck would have pushed 4 the bumper to on the Escape. 5 Q Gotcha. 6 So the red line is going to be at a 7 higher level than the blue line? 8 A Yes. 9 Q And how did you determine the height to 10 use for the red line? 11 A I just look at the car. There's a huge 12 bumper imprinted on the tailgate of the car. 13 Q And you just matched it up with the 14 anticipated bumper height in the subject vehicle? 15 A No, you just measure the -- where the 16 bumper hit. It's not anticipated. You can look at 17 it and see the bumper. I mean, it's like -- I 18 mean, you can see the shape of the bumper in 19 the tail -- in the tailgate, so you just measure 20 that. 21 Q All right. Do you have in here any -- 22 indicated anywhere what height that was, that -- 23 that you determined the bumper impacted the Escape 24 in the actual accident? 25 A Okay. Well, it's at the height it's at</p>
<p style="text-align: right;">Page 215</p> <p>1 corresponds, you know, to the bumper area of the 2 vehicle. 3 Q And again, when you mentioned elevation, 4 you're referring to that line up above 2.2 feet 5 above ground? 6 A Yes. 7 Q And that's the bumper height? 8 A Well, yeah, it's within the bumper 9 height, yes. 10 Q Yeah, to the center of the bumper height 11 or what -- how -- how is that calculated? 12 A No, it's -- HVE has its own reporting 13 levels. This is the level that corresponds to the 14 elevation of the bumper. I don't think it's in the 15 dead center of the bumper. It's not trying to do 16 that. It's saying based on the geometry of the 17 cars that we had, this is the crush at that level. 18 Q And does it pick that level or did you 19 input that level? 20 A No, it picks it. It -- it -- based on 21 the geometry of the car you give it, it reports a 22 certain -- it -- it reports levels of crush. 23 And this is the one that's at the same 24 level as that red line. Or reasonably it's at the 25 level where the -- the -- the truck hit and where</p>	<p style="text-align: right;">Page 217</p> <p>1 on the car. Remember the car has changed shape 2 quite a bit. It's been exploded is what I said. 3 So the height it's at now -- like the tow 4 hooks are a couple of inches higher than the bottom 5 of the -- of the lift gate or the -- yeah, I -- I 6 measured that. 7 So the -- the photos show the height, but 8 what's really important is the level of the height. 9 In other words, and we -- we know that 10 the -- there's an imprint of the top of the bumper 11 of the Escape on the bottom of the truck's bumper. 12 So we found the -- the tread on the -- 13 that 5-inch wide bumper on the Escape made an 14 imprint on the bottom of the bumper of the truck. 15 So we know the bumper of the truck went -- went 16 over that. 17 So I can -- I can go -- we know the top 18 of the bumper was 28 inches on the Escape. So, you 19 know, we can give you all of those numbers, but -- 20 but the height of the bumper -- height of the 21 damage on the car now is completely different than 22 what it was before it got exploded because the -- 23 the car's been so badly damaged. 24 So the -- a lot of ways to answer it, but 25 the answer really is, is the tailgate above the</p>

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<p style="text-align: right;">Page 218</p> <p>1 bumper where the dent is it started out being more 2 than 28 inches and now it's just at whatever height 3 the poor crushed vehicle is sitting at with flat 4 tires and everything else. 5 Q Understood. When HVE comes up with the 6 simulation height, does it use the vehicle that's 7 struck or does it use the striking vehicle? 8 A Well, it uses both of them. It knows the 9 shapes of the vehicle. So it knows that the bumper 10 sticks out. It knows, you know, what's going to 11 hit first. And then it runs its calculations. And 12 then when it gets done, it gives you an array of 13 heights. 14 And then as an investigator on my part, I 15 look at those and I choose which height I -- I want 16 to discuss out of all of those. 17 But it also gives you a visualization of 18 it, which you can see. And what I reported here 19 was the height, the effective height at -- at a -- 20 in that 20- to 30-inch range where all the bumpers 21 are. 22 Q Gotcha. 23 And that's what I was getting at is, it's 24 my understanding that HVE is going to give you a 25 range of heights. And you're saying you received</p>	<p style="text-align: right;">Page 220</p> <p>1 A I didn't understand your question. I -- 2 I was -- I didn't know what you were saying coming 3 in. I heard the end but not the beginning. 4 Q Sorry. Can you hear me now? 5 A Yes, sir. 6 Q All right. So even in the simulation 7 where there's bumper-to-bumper contact, there's 8 still going to be crush experienced by the hatch; 9 is that fair? 10 A Yes. 11 Q And there's going to be a distance of 12 that crush from the point where the hatch started 13 to the point where it ends? 14 A Yes. 15 Q All right. And so I'm asking about that 16 crush, that value, not from the bumpers -- the end 17 of the bumper but from the end of where the hatch 18 is? 19 A Okay. 20 Q Does HVE provide you that measurement of 21 crush? 22 A It -- it does. And we can go plot it, 23 but it won't -- it'll be comparable to the blue 24 line there. 25 It won't be an effective difference that</p>
<p style="text-align: right;">Page 219</p> <p>1 that, but you really are only interested in or 2 commenting on the one height you selected and 3 that's the 2.2 feet? 4 A Yeah, because that represents the maximum 5 crush. 6 Q Right. So the other heights would have 7 less crush? 8 A Well, technically, yes, because they 9 don't stick out as far as the bumper. 10 Q Less crush from the end of the bumper, 11 but would they have less crush from their starting 12 point? 13 A Yes, because your -- the bumpers have a 14 5-inch lead on everything else. And that 5-inch 15 lead effectively in the calculation makes them 16 stronger. They get -- they're already stronger, 17 but they get -- by the measure of crushing. So 18 they're going to -- they're going to -- we can go 19 plot it, but nothing's going to stick out past the 20 bumper from a practical standpoint. 21 Q Yeah, I understand that. I'm just trying 22 to get -- let's say HVE gave you crush data for the 23 hatch in the simulation, higher than the bumper, 24 right? That data was provided by the simulation; 25 is that correct?</p>	<p style="text-align: right;">Page 221</p> <p>1 we're -- from what we looked at in the data when we 2 got it because you can visualize it. 3 So we can actually -- instead of 4 discussing it, we can pull it up and look at it, 5 but it's all going to be very well represented -- 6 yeah, there's one. 7 Q Yeah. 8 A There should be an angle view of that as 9 well. 10 Yeah, there you go. 11 So, you know, basically made the back of 12 a vehicle relatively flat. 13 The blue line, I think, is drawn for on 14 the bumper, but it also represents a little bit 15 above the bumper as well. 16 As you get up into the roof, the roof 17 isn't crushed at all. 18 Q This picture on 1368, is that generated 19 solely by HVE? 20 A Solely by HVE. 21 Q All right. Same for 1369? 22 A Yes. 23 Q And then what's shown on 1370 and 1371, 24 that was generated by you using the overlays? 25 A Yes, that's -- that's our 3-D models</p>

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<p style="text-align: right;">Page 222</p> <p>1 stuck together.</p> <p>2 Q And that's --</p> <p>3 A And that -- yeah, and the red car there</p> <p>4 is an uncrushed vehicle. That's a -- the exemplar.</p> <p>5 And then the next slide, I think you</p> <p>6 flipped to, with the blue vehicle is the -- that's</p> <p>7 the uncrushed. Yeah, the blue vehicle or what</p> <p>8 looks almost black here is the actual accident</p> <p>9 vehicle.</p> <p>10 Q And that's 1372 you're referring to?</p> <p>11 A Thank you.</p> <p>12 Q And this is just your overlay of an</p> <p>13 undamaged Escape illustrating the, I guess, level</p> <p>14 of crush in the subject accident?</p> <p>15 A Yes. Relative to an undamaged Escape.</p> <p>16 Q All right. And then 1373, what does it</p> <p>17 represent?</p> <p>18 A That's just another view of the same</p> <p>19 thing you were looking at. It's the -- it's how</p> <p>20 far the truck penetrated relative to an undamaged</p> <p>21 Escape.</p> <p>22 Q What's the difference between 1372 and</p> <p>23 1374?</p> <p>24 A Well, 1372 is the damaged Escape. 1374</p> <p>25 is the damaged Escape and the exemplar undamaged</p>	<p style="text-align: right;">Page 224</p> <p>1 MR. HILL: Okay, always welcome those.</p> <p>2 A Okay. I did math. You asked me had I</p> <p>3 done the calculation? I said, "No, I did it in my</p> <p>4 head." And -- and I saw the amount of body lift</p> <p>5 and I made a mistake.</p> <p>6 We have the total lift to be 6.1 to</p> <p>7 6.6 inches. And then the tires make up about half</p> <p>8 an inch of that. So, therefore you're left with a</p> <p>9 body lift of 6 to 6 1/2 inches.</p> <p>10 So .04 feet times 12 is half an inch. So</p> <p>11 effectively we still have a 6-inch -- we still have</p> <p>12 a 6-inch lift, body lift within a range.</p> <p>13 So I had done the math poorly earlier</p> <p>14 when I said 5 1/2. I had -- I had mis --</p> <p>15 misexpressed it.</p> <p>16 BY MR. HILL:</p> <p>17 Q And the difference is the increase in</p> <p>18 height from the non-OEM tires that were on the</p> <p>19 subject F250?</p> <p>20 A Yes, that is only .04 feet.</p> <p>21 Q Right.</p> <p>22 A It's only .04 feet. And -- and so I -- I</p> <p>23 did the math wrong. I used it as a .4. So that</p> <p>24 was my mistake.</p> <p>25 Q And there was also a .04 difference in</p>
<p style="text-align: right;">Page 223</p> <p>1 Escape occupying the exact same space.</p> <p>2 And so you can -- you can see the</p> <p>3 undamaged one in the red. And then, of course, you</p> <p>4 can see the deformed metal of -- of blue or what</p> <p>5 appears black here of the damaged one.</p> <p>6 So you can see how much of the red Escape</p> <p>7 had to be moved forward to produce the -- the black</p> <p>8 or blue Escape.</p> <p>9 Q Gotcha.</p> <p>10 All right. I'm just checking to make</p> <p>11 sure I marked everything and then I'll be finished.</p> <p>12 A Okay. I'm going to stand up again,</p> <p>13 please.</p> <p>14 MR. HILL: And we can go off the record</p> <p>15 for a second.</p> <p>16 VIDEO TECHNICIAN: The time is 4:51. We</p> <p>17 are off the record.</p> <p>18 (Off the record.)</p> <p>19 VIDEO TECHNICIAN: The time is 4:55.</p> <p>20 We're back on the record.</p> <p>21 MR. HILL: Thank you, Mr. Buchner, I</p> <p>22 appreciate your time today. That's all that I</p> <p>23 have.</p> <p>24 THE WITNESS: I have a correction to a</p> <p>25 mistake I made.</p>	<p style="text-align: right;">Page 225</p> <p>1 feet between the 2015 tires on the -- your exemplar</p> <p>2 model and the 2016 placard size?</p> <p>3 A Yeah, that's what we're taking out there.</p> <p>4 We're saying the total lift on the</p> <p>5 vehicle was -- I think we say 6.1 -- in the report</p> <p>6 we say 6.1 inches. The effective total body lift</p> <p>7 was 6.1 inches.</p> <p>8 In my calculations we have it up to</p> <p>9 .55 feet, which is 6.6 inches. And then we're</p> <p>10 going to end up subtracting .04 feet off of that</p> <p>11 which is half an inch -- let me do that again.</p> <p>12 12 times -- oh, no, it's not -- yeah,</p> <p>13 never do calculations in a deposition. Yeah.</p> <p>14 So let me -- can you go to the base data</p> <p>15 summary?</p> <p>16 Q The -- the what?</p> <p>17 A It's this sheet here. It's very early in</p> <p>18 the engineering analysis.</p> <p>19 Q All right. Let me see if I can find it.</p> <p>20 A Okay.</p> <p>21 Q There you go.</p> <p>22 A Okay. So the second and third boxes show</p> <p>23 that the difference in height between the accident</p> <p>24 and the exemplar vehicle was .55 feet.</p> <p>25 And then if we come down just a little</p>

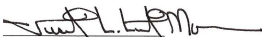
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<p style="text-align: right;">Page 226</p> <p>1 bit, we want to take the tires out of that, the 2 .35 inches, which is in the fourth box down, is 3 only .03 feet. 4 So if we do .55 minus .03 we get .52. 5 And that's .52 feet, multiply that by 12, we get 6 6 1/4 inches. 7 So effectively the total lift was closer 8 to 6 1/2 and the body lift was a little over 6. 9 Just to clarify. 10 And so 6.1 that I put in the report was 11 the body lift. It was intended to be the body 12 lift. So the body lift really is a little over 6 13 inches. When you add the tires in you're closer to 14 the 6 1/2 inches. 15 So I -- I was mistaken when I said 5 1/2 16 earlier. I missed my decimal points. And I -- I 17 thought the .35 or the .7 that's right there was in 18 feet. It's not. It's -- I thought it was at 19 .07 feet, it's not, it's .07 inches, and so I made 20 a mistake. So body lift is more than 6 inches. 21 Q The third box that has the bracket 22 height, how did you come up with those numbers, 23 those values? 24 A Well, I laid on the ground under both 25 vehicles and measured the height off the ground.</p>	<p style="text-align: right;">Page 228</p> <p>1 that's where you get a difference of .35 inches; is 2 that -- am I reading that right? 3 A Yeah, it's really point -- it's not quite 4 half inch, more like a third of an inch. But yeah, 5 .35 inches is the difference in your tires. 6 Q Do you have an explanation for why a 7 4 1/2-inch lift would raise the height of the 8 vehicle 6.1 or -- or that range? What is the 9 explanation there? 10 A Yes, I do have an explanation. What 11 they're doing -- I believe it's -- they're leveling 12 it which requires lifting the front and then 13 they're lifting. 14 So it's a combination of the leveling 15 effect and the lift effect. So at the back we're 16 lifting it more like 4 1/2 inches but at the front 17 we're lifting it more like 6, 6 1/2 inches or let's 18 just say 6 or a little more. 19 Q And that's because from your manufacturer 20 there's a -- I don't know if the proper word, if 21 it's camber or slant, where the rear of the vehicle 22 is slightly higher than the front? 23 A Yes. And -- yes, and that's my belief. 24 That's how the math works. That's what I look at. 25 That's what I think when I see it.</p>
<p style="text-align: right;">Page 227</p> <p>1 And then, you know, we, of course, check 2 the scans as best we can as well and, you know -- 3 so we have two competing methods. And then -- 4 Q When you measured -- 5 A But if you look in the -- in my 6 engineering analysis, both the photos I used are in 7 there. 8 Q All right. 9 A With tape measures on them. 10 Q When you measured the bracket height on 11 the exemplar and you came up with a number 12 1.05 feet, do you see that in the third box? 13 A Yes. 14 Q Did that take into account the 15 approximately half-inch lower the exemplar was from 16 a stock 2016 F250? 17 A No, that's going to be taken up in the 18 tire size down below it. 19 Q All right. So that difference does not 20 reflect the true difference between a stock and the 21 accident? 22 A That's my recollection, yes. 23 Q Okay. So the real difference is when you 24 have the tire size, that's taking into account the 25 fact that your exemplar was half an inch low and</p>	<p style="text-align: right;">Page 229</p> <p>1 But practically the only thing I'm -- I'm 2 concerned about is how much did the front go up, 3 and the answer is a little over 6 inches. 4 Q Did you measure how far the back went up? 5 A Not specifically, but I remember 6 measuring the spacers that were put in and it -- 7 thinking, well, that's effectively 4 1/2 inches at 8 the back. So it's very close to 4 1/2 inches. 9 Q So you -- you suspect that the -- the 10 back was an inch and a half higher than the front 11 from its original configuration approximate? 12 A I don't suspect one way or the other, 13 I'm -- I'm -- 14 Q Okay. 15 A That's a good -- that's a good theory 16 from the data I've given you and I don't -- I'm not 17 going to argue about it. 18 I'm just -- from a practical standpoint I 19 just want to know how much the front went up, and, 20 you know, it's 6 inches or a little more. 21 Q And this, while we have it up, 3970, the 22 last column just so that I make sure because that's 23 what I was asking you about before, the crush 24 analysis Escape stiffness coefficients came from 25 SAE and then the value you see under Simulation</p>

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<p style="text-align: right;">Page 230</p> <p>1 were generated without your input by HVE?</p> <p>2 A Yes.</p> <p>3 Q Okay. Do you know how HVE comes to the</p> <p>4 determination of the stiffness coefficient for the</p> <p>5 Escape?</p> <p>6 A I'm pretty sure Terry Day that's been</p> <p>7 part of HVE and one of the authors of the whole</p> <p>8 program, I believe he determined that years ago.</p> <p>9 I think if you go back through the</p> <p>10 historical documents, he -- he has papers that he</p> <p>11 was offering about what the crush stiffness of</p> <p>12 various vehicles are. And I believe that's from</p> <p>13 one of his earlier papers.</p> <p>14 Q Gotcha.</p> <p>15 Do you know whether he based that on</p> <p>16 actual crash testing or how he calculated that?</p> <p>17 A He -- based on his vast experience. I</p> <p>18 mean, he's -- that's what he's doing with the</p> <p>19 program is comparing it to crash test and staging</p> <p>20 accidents and everything else.</p> <p>21 So you're asking -- it's in the program,</p> <p>22 it's what they're -- what you get when you pay for</p> <p>23 the program. And it's -- it's a reasonable</p> <p>24 representation.</p> <p>25 You asked me my judgment a little bit on</p>	<p style="text-align: right;">Page 232</p> <p>1 values within the program for the F250?</p> <p>2 A We didn't find them, no, sir.</p> <p>3 Q If you had found them, would you have</p> <p>4 used them in the F -- in the HVE simulation?</p> <p>5 A Yes.</p> <p>6 Q Give me one second.</p> <p>7 So, again, on this if the simulation</p> <p>8 thickness coefficient for the F250, if the A value</p> <p>9 went up, that would result in it being stiffer.</p> <p>10 And you're saying it would cause more crush on the</p> <p>11 Escape than what the 520 value would represent; is</p> <p>12 that fair?</p> <p>13 A Possibly, depending on how much it went</p> <p>14 up, yes. That would be the trend.</p> <p>15 Q And would the same be true for B?</p> <p>16 A Yes, that would be the trend.</p> <p>17 Q How much would the constant A have to go</p> <p>18 up for it to increase the crush level in the</p> <p>19 simulation, do you know?</p> <p>20 A It's -- no. You know the trend, of</p> <p>21 course, but it's -- it's not likely to be highly</p> <p>22 sensitive to it, but it will definitely trend up.</p> <p>23 But I didn't -- I don't have a</p> <p>24 correlation I can tell you off the top of my head.</p> <p>25 Q And if you used higher values in your</p>
<p style="text-align: right;">Page 231</p> <p>1 where it came from and I -- I believe that if you</p> <p>2 go look through everything, you'll find that Terry</p> <p>3 Day was part of establishing those values because I</p> <p>4 think those values show up in some of his earlier</p> <p>5 papers.</p> <p>6 But just to point out they're</p> <p>7 conservative for this crash. In other words,</p> <p>8 they're going to show -- they're -- they're --</p> <p>9 they're the lowest values that we could find and so</p> <p>10 they're going to overreport crush.</p> <p>11 Whereas, the more -- what I believe are</p> <p>12 probably more current values are going to</p> <p>13 underreport crush and that's where 2.1 to 2.3 is</p> <p>14 coming from.</p> <p>15 Q The same would be true for the F250, if</p> <p>16 the simulation stiffness coefficients were lower,</p> <p>17 how would that impact the simulation?</p> <p>18 A Well, it would shift crush to the F250.</p> <p>19 So the F250 would absorb it so the Escape wouldn't</p> <p>20 have to absorb it.</p> <p>21 Q And it would effectively produce crush</p> <p>22 into the Escape as well?</p> <p>23 A Yes, and vice versa, of course.</p> <p>24 Q All right. And it's -- and it's your</p> <p>25 belief that the simulation program does not contain</p>	<p style="text-align: right;">Page 233</p> <p>1 crush analysis, is the same true, same trend?</p> <p>2 A Yes.</p> <p>3 MR. HILL: All right. Thank you for</p> <p>4 clarifying that.</p> <p>5 I don't think I have any other questions.</p> <p>6 MS. CANNELLA: All right. So we're done.</p> <p>7 I don't have any.</p> <p>8 THE WITNESS: I'll read.</p> <p>9 VIDEO TECHNICIAN: This concludes the</p> <p>10 videotape deposition. The time is 5:11 p.m. We</p> <p>11 are off the record.</p> <p>12 (Deposition concluded at 5:11 p.m.)</p> <p>13 (Signature requested.)</p> <p>14</p> <p>15 * * * * *</p> <p>16</p> <p>17</p> <p>18</p> <p>19</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p>

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<p>Page 234</p> <p>1 The following reporter and firm disclosures were presented by me at this proceeding 2 for review by counsel: REPORTER DISCLOSURES 3 The following representations and disclosures are made in compliance with Georgia 4 Law, more specifically: Article 10 (B) of the Rules and 5 Regulations of the Board of Court Reporting (disclosure forms). 6 OCGA Sections 9-11-28 (c) (disqualification of reporter for financial 7 interest). OCGA Sections 15-14-37 (a) and (b) 8 (prohibitions against contracts except on a case-by-case basis). 9 - I am a certified court reporter in the state of Georgia. 10 - I am a subcontractor for Veritext. - I have been assigned to make a complete and 11 accurate record of these proceedings. - I have no relationship of interest in the matter 12 on which I am about to report which would disqualify me from making a verbatim record or 13 maintaining my obligation of impartiality in compliance with the Code of Professional Ethics. 14 - I have no direct contract with any party in this action, and my compensation is determined solely by 15 the terms of my subcontractor agreement. FIRM DISCLOSURES 16 - Veritext was contacted to provide reporting services by the noticing or taking attorney in this 17 matter. - There is no agreement in place that is prohibited 18 by OCGA 15-14-37(a) and (b). Any case-specific discounts are automatically applied to all parties, 19 at such time as any party receives a discount. - Transcripts: The transcript of this proceeding 20 as produced will be a true, correct, and complete record of the colloquies, questions, and answers as 21 submitted by the certified court reporter. - Exhibits: No changes will be made to the 22 exhibits as submitted by the reporter, attorneys, or witnesses. 23 - Password-Protected Access: Transcripts and exhibits relating to this proceeding will be 24 uploaded to a password-protected repository, to which all ordering parties will have access. 25</p>	<p>Page 236</p> <p>1 FIRM CERTIFICATE AND DISCLOSURE 2 3 Veritext represents that the foregoing transcript as produced by our Production Coordinators, Georgia 4 Certified Notaries, is a true, correct and complete transcript of the colloquies, questions and answers 5 as submitted by the certified court reporter in this case. Veritext further represents that the 6 attached exhibits, if any, are a true, correct and complete copy as submitted by the certified 7 reporter, attorneys or witness in this case; and that the exhibits were handled and produced 8 exclusively through our Production Coordinators, Georgia Certified Notaries. Copies of notarized 9 production certificates related to this proceeding are available upon request to 10 production@veritext.com 11 Veritext is not taking this deposition under any relationship that is prohibited by OCGA 15-14-37 12 (a) and (b). Case-specific discounts are automatically applied to all parties, at such time 13 as any party receives a discount. Ancillary services such as calendar and financial reports are 14 available to all parties upon request. 15 16 17 18 19 20 21 22 23 24 25</p>
<p>Page 235</p> <p>1 CERTIFICATE 2 Deposition of: G. BRYANT BUCHNER, PE Date of Deposition: JANUARY 23, 2024 3 4 STATE OF GEORGIA: 5 6 I hereby certify that the foregoing 7 transcript was stenographically recorded by me 8 via Zoom as stated in the caption. The deponent 9 was duly sworn to tell the truth, the whole truth, 10 and nothing but the truth. And the colloquies, 11 statements, questions and answers thereto were 12 reduced to typewriting under my direction and 13 supervision and the deposition is a true and 14 correct record, to the best of my ability, of 15 the testimony/evidence given by the deponent. 16 I further certify that I am not a 17 relative or employee or attorney or counsel to 18 any of the parties in the case, nor am I a 19 relative or employee of such attorney or counsel, 20 nor am I financially interested in the action. 21 This, the 1st day of February 2024. 22 23  24 JUDITH L. LEITZ MORAN, UCR-B-2312 Registered Professional Reporter 25</p>	<p>Page 237</p> <p>1 TO: Tedra L. Cannella, Esq. tedra@cannellasnyder.com 2 Re: Signature of Deponent G. Bryant Buchner, PE 3 Date Errata due back at our offices: 30 days 4 5 Greetings: 6 The Deponent has reserved the right to read and sign. Please have the deponent review the attached 7 PDF transcript, noting any changes or corrections on the attached PDF Errata. The deponent may fill 8 out the Errata electronically or print and fill out manually. 9 10 Once the Errata is signed by the Deponent and notarized, please mail it to the offices of Veritext (below). 11 12 When the signed Errata is returned to us, we will seal and forward to the taking attorney to file with the original transcript. We will also send 13 copies of the Errata to all ordering parties. 14 If the signed Errata is not returned within the time above, the original transcript may be filed 15 with the court without the signature of the Deponent. 16 17 Please send completed Errata to: Veritext Production Facility 18 20 Mansell Court E, Suite 300 Roswell, Georgia 30076 19 (770) 343-9696 cs-southeast@veritext.com 20 21 22 23 24 25</p>

1 ERRATA FOR CASE NO. 6395968

2 I, the undersigned, do hereby certify that I have

3 read the transcript of my testimony, and that

4

5 ____ There are no changes noted.

6 ____ The following changes are noted:

7

8 Pursuant to Rule 30(7)(e) of the Federal Rules of

9 Civil Procedure and/or OCGA 9-11-30(e), any changes

10 in form or substance which you desire to make to

11 your deposition testimony shall be entered upon the

12 deposition with a statement of the reasons given

13 for making them. To assist you in making any such

14 corrections, please use the form below. If

15 supplemental or additional pages are necessary,

16 please finish same and attach them to this errata

17 sheet.

18

19	Page/Line/	Change	/	Reason
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21	____/____/	_____	/	_____
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17

18 _____

19 G. BRYANT BUCHNER, PE

20

21 Sworn to and subscribed before me
this ____ day of _____, 20__.

22

23 _____

24 Notary Public.

25 My Commission Expires _____.

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Georgia Code

Title 9, Chapter 11

Article 5, Section 9-11-30

(e) Review by witness; changes; signing.

If requested by the deponent or a party before completion of the deposition, the deponent shall have 30 days after being notified by the officer that the transcript or recording is available in which to review the transcript or recording and, if there are changes in form or substance, to sign a statement reciting such changes and the reasons given by the deponent for making them. The officer shall indicate in the certificate prescribed by paragraph (1) of subsection (f) of this Code section whether any review was requested and, if so, shall append any changes made by the deponent during the period allowed. If the deposition is not reviewed and signed by the witness within 30 days of its submission to him or her, the officer shall sign it and state on the record that the deposition was not reviewed and signed by the deponent within 30 days. The deposition may then be used as fully as though signed unless, on a motion to suppress under paragraph (4) of subsection (d) of Code

Section 9-11-32, the court holds that the reasons given for the refusal to sign require rejection of the deposition in whole or in part.

DISCLAIMER: THE FOREGOING CIVIL PROCEDURE RULES ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY. THE ABOVE RULES ARE CURRENT AS OF APRIL 1, 2019. PLEASE REFER TO THE APPLICABLE STATE RULES OF CIVIL PROCEDURE FOR UP-TO-DATE INFORMATION.

VERITEXT LEGAL SOLUTIONS

COMPANY CERTIFICATE AND DISCLOSURE STATEMENT

Veritext Legal Solutions represents that the foregoing transcript is a true, correct and complete transcript of the colloquies, questions and answers as submitted by the court reporter. Veritext Legal Solutions further represents that the attached exhibits, if any, are true, correct and complete documents as submitted by the court reporter and/or attorneys in relation to this deposition and that the documents were processed in accordance with our litigation support and production standards.

Veritext Legal Solutions is committed to maintaining the confidentiality of client and witness information, in accordance with the regulations promulgated under the Health Insurance Portability and Accountability Act (HIPAA), as amended with respect to protected health information and the Gramm-Leach-Bliley Act, as amended, with respect to Personally Identifiable Information (PII). Physical transcripts and exhibits are managed under strict facility and personnel access controls. Electronic files of documents are stored in encrypted form and are transmitted in an encrypted

fashion to authenticated parties who are permitted to access the material. Our data is hosted in a Tier 4 SSAE 16 certified facility.

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